P53

G.M. 1914

444 & 14.

S.L. No 1-22.

11

Invention for Improved process & and apparatus for converting petroleum & of high boiling point into petroleum & a lower boiling point by the Standard oil Co, Chicago.

G. R. S. IX-5]

*Previous references.*

**File No.** 444-12

**1914.**

**Serial Nos.** 1-23

(Gen. Dis.)

*Later references.*

Gen. 137-19(163).
213-19(1-8)

Rec'd Br (Secl Lr) may be consulted re preservation of Documents

# GENERAL AND REVENUE SECRETARIAT.

*Serial Nos.*

**Part B for** July 1916.

SUBJECT.

Invention for "Improved process of and apparatus for converting petroleum of a high boiling point into petroleum of a lower boiling point" by the Standard Oil Co. Chicago.

23. From Chr. Supt.
Advs: The receipt of the specification of an —

19/7/16

W D 88—GPB—50,000—24-7-16

10948

G.R.S. 11] 1914-15

GENERAL AND REVENUE SECRETARIAT.

(Gen: Mis)

NOTES.

Gen File No. 4444 14/15

FILE HEADING.

Invention for "Improved process of and apparatus for converting Petroleum of a high boiling point into petroleum of a lower boiling point" by the Standard Oil Co., Chicago.

From

Messrs Rempry & Son, Calcutta.

No. — Dated 4. 8. 15 Received 8. 8. 15

| Diary No. 7766 | Enclos. 3 + Rs 12 Spare Copies. | Serial No. 1 |
|---|---|---|

BRIEF ABSTRACT OF LETTER.

Forward an applⁿ for leave to file a specification of the invention and also a Deed of assignment and a power-of-attorney and remit Rs 12/- as applⁿ & stamp fees thereon.

NOTES AND ORDERS.

2 From the same. dy 7. 6. 15

With refce to the above, forward a Certified copy of the British Complete Specifn and Drawings in respect of the same invention.

The usual drafts are subd

EA 26/8/15 Init

Issued 28/8

NOTES—First Sheet.

GPB—35,000—15 6-12

1439 (2

G. R. S. 12]

General and Revenue Secretariat.

G. M. File No. 1484 of 1914.

| Serial No. | |
|---|---|
| 3 | To the Depty Comsr. Treasury dept. No. G. 1590 dt 5.8.15 |
| | Forwards Rs. 10/- received with sl. 1 and requests acknt. |
| 4 | To the Supdt of Stamps No. G. 1591 dt 5.8.15 |
| | Forwards Deed of Assignment & Power of Attorney received with sl. 1 and requests that they may be impressed with the Impress General stamps of the value of one Rupee & returned. |
| 5 | To the Dy. of Education No. G/1592 dt 5.8.15 |
| | Forwards the application received with sl. 1 and requests that the opinion of Mr. G.D. Metcalfe Professor of Physics, Central College, may be obtained & forwarded to this office. |
| 6 | From the Dy: Comsr. Treasury dept No. 83 dt 9.8.15 |
| | Acknowledges receipt of the amount Sent in sl. 3 above. |
| 7 | From the Superintendent of Stamps No. F.B 68 dt 11.8.1915 |
| | Returns duly Stamped the Deed of Assignment and the Power of Attorney forwarded with sl. 4 |
| | The opinion of Mr. Metcalfe about the invention in question called for in sl. 5 above has not yet been furnished. Draft reminder to the Dy. of Educatn is submtd. Issue |
| | 7/12/15 |
| | 2/12 |
| | Issued No. G. 6984 dt 4.12.15 |

NOTE—Contn. sheet.

GPB—25,000—30-4-15

1439
704/1700(a)

(3)

G. R. S. 12]

General and Revenue Secretariat. | G.M. File No. 444 of 1916.

| Serial No. | |
|---|---|
| 8 | From the D.G. of Education No. 14417/574 dt. 2-2-16<br>With reference to Sl 5 above forwards Copy of letter from Mr. Metcalfe stating that said leave may be granted in respect of the invention.<br>Drafts Subtd.<br>Kuttō 21/2/16<br>KB 16/2-16<br>Asst Member<br>Offg Secy to Govt<br>Ch<br>Secy.<br>Mem<br>9.3 |
| 9 | From Messrs Remfry & Son letter dt. 24-2-16 |
| ~~10~~ | Forwards a certified copy of the British Specification & drawings No. 11 4/15 in respect of the invention in question :— |
| 10 | To. The Standard Oil Co. Ltd. U.S.A.<br>No. G 12893 dt. 15-3-16<br>Authorizes the applicant to file a Specification of the said invention. |
| 11 | To. Messrs Remfry & Son. Calcutta.<br>No. G 12894 dt. 15-3-16<br>Forwards the G.O. referred to in SL 10 & requests them to ~~forward~~ intimate the facts to the party Concerned. |
| | Submitted for perusal of Sl. 9 above.<br>Kuttō 17-3-16<br>The leave has been granted - No further action necessary - Records may be filed<br>KB 17/3-16 |

NOTE—Contn. sheet.

GPB—70,000—17-12-15

7700(a)
8483
9154

G. R. S. 12]

General and Revenue Secretariat.

fm. File No. 444 of 1914.

| Serial No. | |
|---|---|
| 12 | From Mess Remfry & Son, Calcutta. Letter dt 23-3-16<br>Forwards 4 copies of the Specification & Rs. 30/- and requests that the Specification may be filed.<br>Of the four Copies of Specifications received only one is signed. Draft returning the other three for being signed & retransmitted is submtd for approval.<br>Hd Clk 29-3-16<br>Issue 30/3-16 |
| 13 | To. The Remfry & Son, Calcutta.<br>No 13780 dt 4-4-<br>With reference to 12. States that of the 4 Copies of Specn received only one is signed & therefore returns the other 3 copies for being duly signed & retransmitted. |
| 14 | From —do— Letter dt 15-4-16<br>Resubmits the 3 copies of the Specification returned with the above & states that they may be accepted without their having to send them to the United States of America for signature by the Applicant &c.<br>The copies can be attested by Mess Remfry & Son as they are the duly Constituted agents of the applicants<br>Submtd for orders<br>Hd Clk 28/4/16<br>Issue 28/4/16 |
| | Submtd.<br>1/5/16 |

NOTE—Contn. sheet.

GPB—70,000—17-12-15

J M 1698-15

9154/1706

(5)

G. R. S. 12]

General and Revenue Secretariat.

For File No. 444 of 1914.

Serial No.

The Agent has to certify that the documents are correct [or true] copies. I agree therefore, with the view expressed above by Sor D

15/5

Sor D

Submitted with a draft in accordance with the opinion of Sor. III.

Issue

11/5/16 15/5/16

15 To The Rampray Sons

No G15660 d/18-5-16

With reference to 8 & 14 requests that as the Spms require a certificate to the effect that they are correct or true copies, the same may be attested by him as the Agent of the Applicant Company & returned.

16 From do Letter d/ 9.6.16

Retransmits the copies of the Specification with the necessary endorsements as required in the above.

Usual drafts Subtd. The certificate at the foot of the G.O. Sl. 10 above may also be initialled

15/6/16

Issue

NOTE—Contn. sheet.

GPB—70,000—17-12-15

10706
1109 & 352 6

G. R. S. 12]

General and Revenue Secretariat.

G.R. File No. 444 of 1914.

| Serial No. | |
|---|---|
| 17 | To. Treasury Officer Bangalore Dist. Tj<br>No G 17041 & 23-6-16<br>Forwards Rs 30/- referred to in sl 12<br>and requests acknowledgement. |
| 18 | To. The Compiler No G 17042 & 23-6-16<br>Notifies the registration of the<br>Specification referred to in sl 12. |
| 19 | To. Messrs. Remfry & Sons<br>No G 17043 & 23-6-16<br>Forwards copy of sl 18 & requests<br>that the fact may be Communicated<br>to the party concerned. |
| 20 | To. The D. G of Education<br>" Chief Engineer<br>" Supdt Govt Museum<br>No G 17044-6 & 23-6-16<br>Forwards a copy of the Specification<br>referred to in sl 12 & requests an<br>acknowledgement. |
| 21 | From the Supdt Govt Museum No. 241 & 26.6.16 |
| 22 | From the D.G. of Education No. 792/14 & 12.7.16<br>Acknowledge receipt of the Specification forwarded in sl. 20<br>The acknowledgement due from the chief Engineer to sl. 20<br>will be awaited |

Subd
Notes
14/7/16
15/7/16

12/15/7/16

NOTE—Contn. sheet.

GPB—70,000- 17-12-15

352/653

G. R. S. 12]

General and Revenue Secretariat. | Fin. File No. 1444 of 1914

| Serial No. | |
|---|---|
| 23 | From the Chief Engineer No. 7192 & 19.7.16<br>Acknowledges receipt of the Specification forwarded with Sl 20 above.<br>The Treasury has refused to acknowledge the receipt of the amount. This will therefore be sent to the Cash Section for keeping in mind that the amount of Rs. 30/- sent with Sl. 17 above has been acknowledged in the Remittance Register maintained in the Cash Section<br>Subd<br>Reds<br>7/8/16<br>S/o Cash Section<br>Reds 14/8/16<br>14/8/16<br>12/14/8/16<br>The amount was acknowledged in the Remittance Register kept in the Cash Section by Mr. Dalal, Dt. Treasurer.<br>14/8/16<br>14/8<br>Subd<br>The papers may now be filed<br>Reds 23/8/16 |

(Page 7)

B

NOTE—Contn. sheet.

GPB—70,000—17-12-15

V H.C. 43

REGISTERED.

To

THE ~~CONTROLLER OF PATENTS~~, SECY TO THE GOVT OF MYSORE,
~~PATENT OFFICE~~, GENL. & REV. DEPTS.,
~~CALCUTTA~~. BANGALORE,
MYSORE.

FROM

REMFRY & SON,

SOLICITORS AND PATENT AGENTS,

CALCUTTA.

DIARY : 7766

1914-1915
SECTION Gen: Mis
SIR,
FILE NO. 444-14
1

Dated CALCUTTA, the 4th March 1915.

| DEPT. | P. | FILE LR. | M. |
|---|---|---|---|
| FILE INDICATION | | | |
| Mysore Pats. | | | |

*re* STANDARD OIL CO. (MYSORE)

~~*No*~~ *dated*

We have the honour to forward herewith an Application of STANDARD OIL COMPANY, (Indiana) a Corporation of the State of Indiana, Whiting, Lake County, Indiana and of 72, West Adams Street, Chicago, Illinois, United States of America, Manufacturer, for leave to file a Specification under Part I of the Mysore Inventions & Designs Regulation, 1894, in respect of an Invention for "IMPROVED PROCESS OF AND APPARATUS FOR CONVERTING PETROLEUM OF A HIGH BOILING POINT INTO PETROLEUM OF A LOWER BOILING POINT", and solicit the favour of your submitting the same to H.H.the Dewan.

A Deed of Assignment from Edgar Milton Clark in favour of the Applicant Co. (consideration £ 5) and a Power of Attorney under which we are acting are also enclosed and we solicit the favour of your having such Assignment stamped Re. 1/- and Power of Attorney Re. 1/- respectively.

The corresponding British Patent is No. 1226 dated 26th day of January 1915 and a Certified Copy of the printed Specification of such British Patent will be forwarded to your office shortly. Corresponding Application in India No. 2019 d/ 11/2/15.

A Post Office Order for Rs. 12/-/- is sent to-day.

We have the honour to be,
Sir,
Your very obedient servants,

REMFRY & SON

MYSORE APPLICATION.

I.M.B.

P/O (Genl.) 1,000—4-2-14. [1,000—17-3-11]

# A P P L I C A T I O N.

TO

THE DEWAN OF MYSORE,

The Application of STANDARD OIL COMPANY, an Indiana corporation, of Whiting, Indiana and Chicago, Illinois, U. S. A., Manufacturer, for leave to file a Specification under Part I of the Mysore Inventions and Designs Regulation, 1894.

1. The Applicant is in possession of an Invention for "IMPROVED PROCESS OF AND APPARATUS FOR CONVERTING "PETROLEUM OF A HIGH BOILING POINT INTO PETROLEUM OF A "LOWER BOILING POINT", and is the assignee of the Inventor thereof; and to the best of their information and belief, the Invention is new within the meaning of Part I of the Inventions and Designs Regulation, 1894, and no circumstance exists which, if the Applicant is authorised to file a Specification and files it is accordance with that Part, will disentitle them to an Exclusive privilege thereunder in respect of the Invention.

The Applicant has applied for a Patent in the United Kingdom in respect of this Invention, No. 1226 dated the 26th day of January 1915. See Illustrated Official Journal (Patents) No. 1359 page 109.

2. The following is a description of the Invention:-

# S P E C I F I C A T I O N.

TO ALL WHOM IT MAY CONCERN:-

Be it known that we, STANDARD OIL COMPANY (Indiana) a Corporation of the State of Indiana, Whiting, Lake County, Indiana and of 72, West Adams Street, Chicago, Illinois, United States of America, are in possession of an invention for "Improved process of and apparatus for converting petroleum of a high boiling point into petroleum of a lower boiling point", and we the said STANDARD OIL COMPANY (Indiana) do hereby declare the nature of the said invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement thereof, that is to say:-



BOULT, WADE AND TENNANT, LONDON.

Ref no 17
of 1915

This invention relates to improvements in the process and apparatus for converting petroleum of high boiling point into petroleum of lower boiling point as set forth in the specification of

The specification referred to described a process for converting into light petroleum, such as gasoline, the residue of petroleum distillation, such as gas oil or fuel oil which, under atmospheric pressure, will commence to vaporize at about 250° F. and will completely vaporize at a temperature of upward of 650° F. The process consists in distilling these residues under a pressure of upwards of three atmospheres thereby producing a range of temperature of about 650° F. to 850° F. Under these conditions of elevated pressure and temperature a large proportion of the gas oil or fuel oil is converted into petroleums of lower molecular weight.

The apparatus described in the patent specification referred to consists of a still having in direct communication therewith a condenser provided at its lower or discharge end with a pressure regulating valve in order to maintain the pressure in the still at the desired amount. When a still has just been charged the pressure therein is atmospheric and it is desirable to prevent the pressure rising until any contained water has been driven off. As soon, however, as the temperature rises to 250° F. indicating that all the water has been driven off, the valve at the lower end of the condenser is closed in order to allow the pressure in the still to be built up to the required value. It has been found, however, that the open communication between the still and the condenser makes it impossible to maintain and build up the desired pressure in the still until after a considerable amount of petroleum has been distilled over either unconverted or else converted into unsaturated hydrocrabons of the olefine series. During the early stage of distillation the still pressure gradually rises owing to the production of non-condensible gases in the still. The volume of these gases is, however, small compared with the charge of oil in the still and is found to amount to only about 3% of the distillate, and it is found that upwards of 8% of the stock charged is distilled over before sufficient gas has collected in the apparatus to keep the pressure to the desired value. The product so distilled over is undesirable because, as experience has shown, at unduly low pressures only a low quality product can be produced.

The problem is therefore to prevent the condenser from unduly lowering the pressure below three atmospheres during the early part of the oil distillation process. Attempts have been made to build up and maintain the pressure in the still by means of a valve arranged between the still and its condenser which could be closed entirely until the desired pressure in the still has been reached, after which it could be opened sufficiently to allow distillation to take place under the same pressure. This method

of avoiding the pressure reducing effect of the condenser has been found impractical and undesirable particularly since the condensation then occurs without pressure and the light portions fail to condense at all, and each still must be separately regulated with extreme nicety.

According to the present invention this problem is solved owing to the fact that after any contained water has been driven off the pressure reducing effect of the condenser on the still is eliminated by adding to the vapor pressure of the distillate in the condenser the partial pressure of a sufficient quantity of non-condensible gases obtained from the same material in an advanced stage of distillation under elevated heat and pressure. This pressure regulation is very important, as not only does a slight drop in pressure seriously injure the product but a material rise entirely stops the flow of vapors and may produce temperatures and pressures high enough to endanger the apparatus.

Accordingly, the present method in using a battery of stills is to introduce under pressure a sufficient quantity of non-condensible gases produced by the distillation of the same material under elevated heat and pressure in other stills to raise the pressure in the freshly charged still and its condenser to that required for the efficient conversion of the fuel oil therein. The gases are introduced after they have passed through the condensers and have been so freed from the gasoline and other condensible products with which they are mixed.

To facilitate the transfer of these gases to freshly charged stills each still in the battery is connected to a single header by means of valved connections. These valves are normally open so that free communication exists between the individual stills, thereby allowing the pressures to equalize automatically and enabling a single pressure controlling valve to control the pressures in all of the stills simultaneously.

Preferably, a second gas header is used which is under at-

mospheric pressure so that it can be used to conduct away the air driven by heat out of the stills while the water in the oil is being evaporated.

Similarly, two headers are preferably used for the condensed products, one of which is used for the high-grade products while the other is for the low-grade products yielded towards the end of the distillation process. Suitable valved connections are provided between the condensers or separating drums connected to such condensers and these headers. This arrangement also enables the pressures in the various stills to equalize automatically and so prevent harmful variations in any one still.

Other features of the invention will be described in connection with the accompanying drawings in which:

Figure 1 illustrates diagrammatically, by a plan view, a battery of stills constructed and equipped in accordance with this invention; and

Figure 2 is a sectional elevation on the line 2 of Figure 1.

Four stills 1, denoted respectively A, B, C and D, are indicated by dotted representation and will suffice for the purposes of the explanation hereinafter given. These stills are shown under a shed 2, between walls 3, and they communicate with a stack 4, common to all, for carrying off products of combustion from the furnaces under the stills, one of these furnaces being represented at $1^a$ in Fig. 2. A vapor pipe 5 leads from the top of each still to the upper end of the water-cooled coil of a separate condenser 6, and from the bottom of each coil leads, through the inner wall $3^a$ of a housing, of which the side walls $3^b$ are shown, a pipe 7 for conducting the products of the condenser, composed of liquefied distillates and the light, gaseous products of distillation which have not yielded to the action of the condenser, into a separate drum 8 at the top of the latter. From the bottom of each drum leads a pipe 9 containing a meter 10 for measuring the liquefied distillate and having two valved branches $10^a$ and $10^b$ which

discharge, respectively, into header-pipes 11 and 12 closed at one end and containing similar shut-off valves 13 and $13^1$, respectively. These header-pipes discharge to storage-tanks (not shown). Each drum discharges gas from its upper end through a pipe 14 having two valved branches $14^a$ and $14^b$ leading, respectively, into header-pipes 16 and 17, which are closed at one end and contain similar shut-off valves 18 and $18^1$, respectively, these pipes which also lead to storage-tanks (not shown), being connected by a pipe 19 containing a pressure relief valve 20 of any ordinary or suitable type. At 21 is shown, leading from the bottom of each drum to a gutter 22, a valved pipe for drawing off the watery product of condensation of the vapors generated in the early part of the run.

For the purpose of explanation, let it be assumed that three of the stills 1, namely those denoted as A, B, and C, are running at the cracking temperature of upward of 650° F. and under a pressure of about 70 to 75 lbs. of the gases on the contents of the stills. The valves in branches $14^b$ connected with these three stills are open and the gases are discharging into the header-pipe 17 and are being held back by the partly closed valve $18^1$ in the latter and the relief valve 20, to produce the required pressure of 70 to 75 lbs. in that header-pipe and throughout the apparatus of the running stills. The valves in the pipes 21 belonging to these three stills are closed, since all watery vapor from them has been distilled off before they reached the cracking temperature. The valves in branches $10^b$ are open and high-grade liquefied distillate is being discharged from the bottoms of the three respective condensers through the meters into the header-pipe 12 and through its partly open valve $13^1$ to storage. The rate of this discharge is regulated by the valve $13^1$ in the header-pipe 12 to maintain the required pressure throughout the apparatus and discharge the distillate as it is produced. The three stills thus running are all subject to the same pressure by reason of the valves in branches $14^b$

leading to the header-pipe 17 and the valves in branches $10^b$ leading to the header-pipe 12 being open. These stills being connected by the header-pipes 17 and 12, give a sufficient volume of gas and liquid distillate to make the rate of their discharge easily controllable by the valves $18^1$ and $13^1$.

Let it also be assumed that the fourth still, denoted as D, has just been freshly charged and fired. The valve in pipe 21 and the valves in branches $10^a$, $10^b$ and $14^b$, belonging to that still are closed, and the corresponding valve in branch $14^a$ is opened. The still D is thus closed to the 70 to 75 lbs. pressure maintained in the header-pipes 12 and 17, and is open only to the header-pipe 16, which conducts the gases to storage, or to the furnaces. The firing of this still is continued with resultant rise of temperature of its contents. At about 212° F. the watery portions of these contents are driven over through the respective condenser 6 into the drum communicating therewith. From time to time the valve in the respective pipe 21 is opened to discharge the water into the gutter 22. When the water has all been driven off, which is indicated by the temperature of the contents of the still D, the oil portion thereof will begin to distil over at about 250° F. To stop this distillation and the resultant production of low-grade distillate, the valve in the branch $14^a$ belonging to the still D is closed and that in the corresponding branch $14^b$ is gradually opened. This allows the gas from the three other stills, that are running under a pressure of 70 to 75 lbs. in the header-pipe 17, to exert its pressure back through the branch $14^b$, belonging to still D, and the interposed equipment upon the contents of that still to stop the flow of vapors from the latter. In this way the pressure upon the contents of the freshly-charged still is raised to that upon the stills A, B and C. The firing of still D is continued until the temperature of its contents is raised to upward of 650° F., when that still will begin to drive over its gases through the condenser, and drum and branch $14^b$ belonging to it, into the header-pipe 17, and the

production of high-grade liquefied distillate will begin. The valve in branch $10^b$ is now opened and the high-grade distillate produced discharges into the header-pipe 12 in connection with that produced from the other running stills. The four stills are now running in conjunction, all subject to the same control and the same pressure-influences. The sudden generation of excessive or dangerous pressure in one still is prevented by the connection of all through the header-pipes and open valves.

Let it further be presumed that a still, say that denoted A, has completed its run and is ready to be drawn off, cleaned and freshly charged. Its furnace-fire is drawn, and the valves in branches $10^b$ and $14^b$ are closed, thereby shutting it off from the 70 to 75 lbs. pressure in the header-pipes 17 and 12 and from the influence of the stills B, C and D. The valve in the respective branch $14^a$ is slowly opened to permit the gas to pass through the header-pipe 16 to storage or to the furnaces; and the valve in branch $10^a$ is also opened to permit low grade or inferior liquefied distillate produced after closing off the header-pipe 17 to pass through the header-pipe 11 to storage. As soon as the gas that was held under 70 to 75 lbs. pressure in the equipment belonging to still A has been discharged, the tar or residual contents of the still are drawn off and it is made ready to clean and receive a fresh charge. As will be understood, each still in a battery is handled in this way after completing its run.

HAVING now particularly described and ascertained the nature of our said Invention and in what manner the same is to be performed, we declare that what we claim is :-

1. An improvement in the process as set forth in which the gases produced by the distillation of the same material in an advanced stage of distillation under elevated heat and pressure are utilized in giving the initial pressure required to prevent fractional distillation in other stills.

2. An apparatus for carrying out the aforesaid process in which a battery of stills is used, all of which are connected to a common non-condensable gas header by separate valved connections with the ~~distal~~ discharge ends of their respective condensers, for the purpose specified.

3. An apparatus for carrying out the aforesaid process in which a battery of stills is used having pressure equalizing connections with the ~~distal~~ discharge ends of their respective condensers and a single valve for controlling the gaseous pressure in all the stills, for the purpose specified.

4. An apparatus for carrying out the aforesaid process in which a battery of stills is used, each still having separate valved connections ~~with the distal~~ between the discharge ends of their respective condensers and to a pair of distillate headers, whereby the low-grade distillate produced towards the end of the operation may be collected separately from the high-grade distillate.

5. A process for converting petroleums of high molecular weight into saturated petroleums of lower molecular weight substantially as set forth.

6. An apparatus for converting petroleums of high molecular weight into saturated petroleums of lower molecular weight constructed and adapted to operate substantially as described in connection with the accompanying drawings.

3. The Applicant, therefore, applies for leave to file a Specification of the Invention pursuant to Part I of the Mysore Inventions and Designs Regulation, 1894.

Dated this 14th day of November 1914.

STANDARD OIL COMPANY,
(OF INDIANA)

ATTEST

Geo W Siebel
SECRETARY.

By W McCowan
Pr

We, STANDARD OIL COMPANY, the Applicant above named, do declare that what is stated in this Application is true to our knowledge, except as to matters stated on information and belief, and as to those matters we believe them to be true.

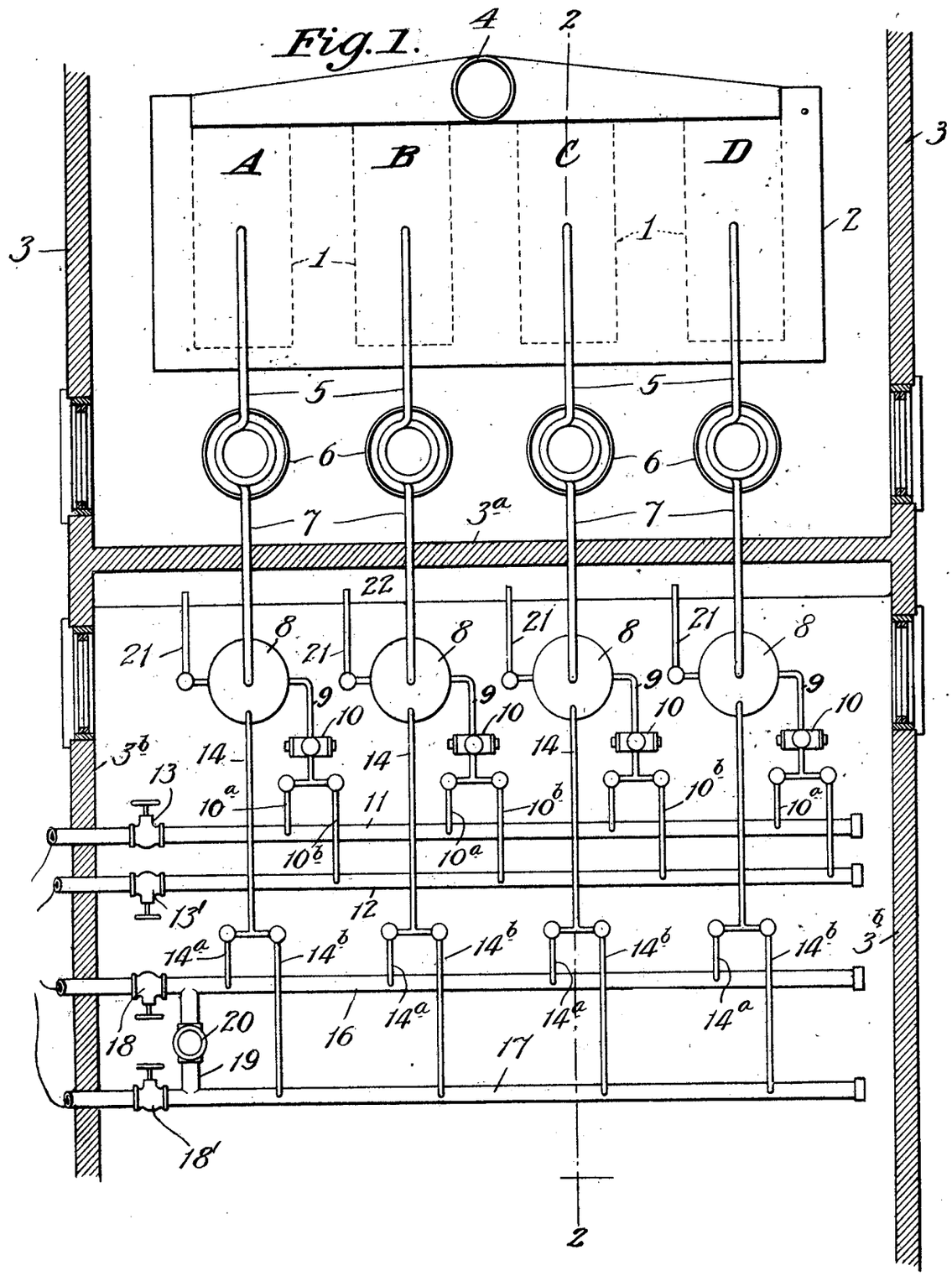
STANDARD OIL COMPANY,
(OF INDIANA)

ATTEST

Geo W Siebel
SECRETARY.

By W McCowan
PRESIDENT

Fig. 1.


4
2
A
B
C
D
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6
7
3a
22
21
8
9
10
3b
14
13
10a
10b
11
13'
12
14a
14b
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19
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18'

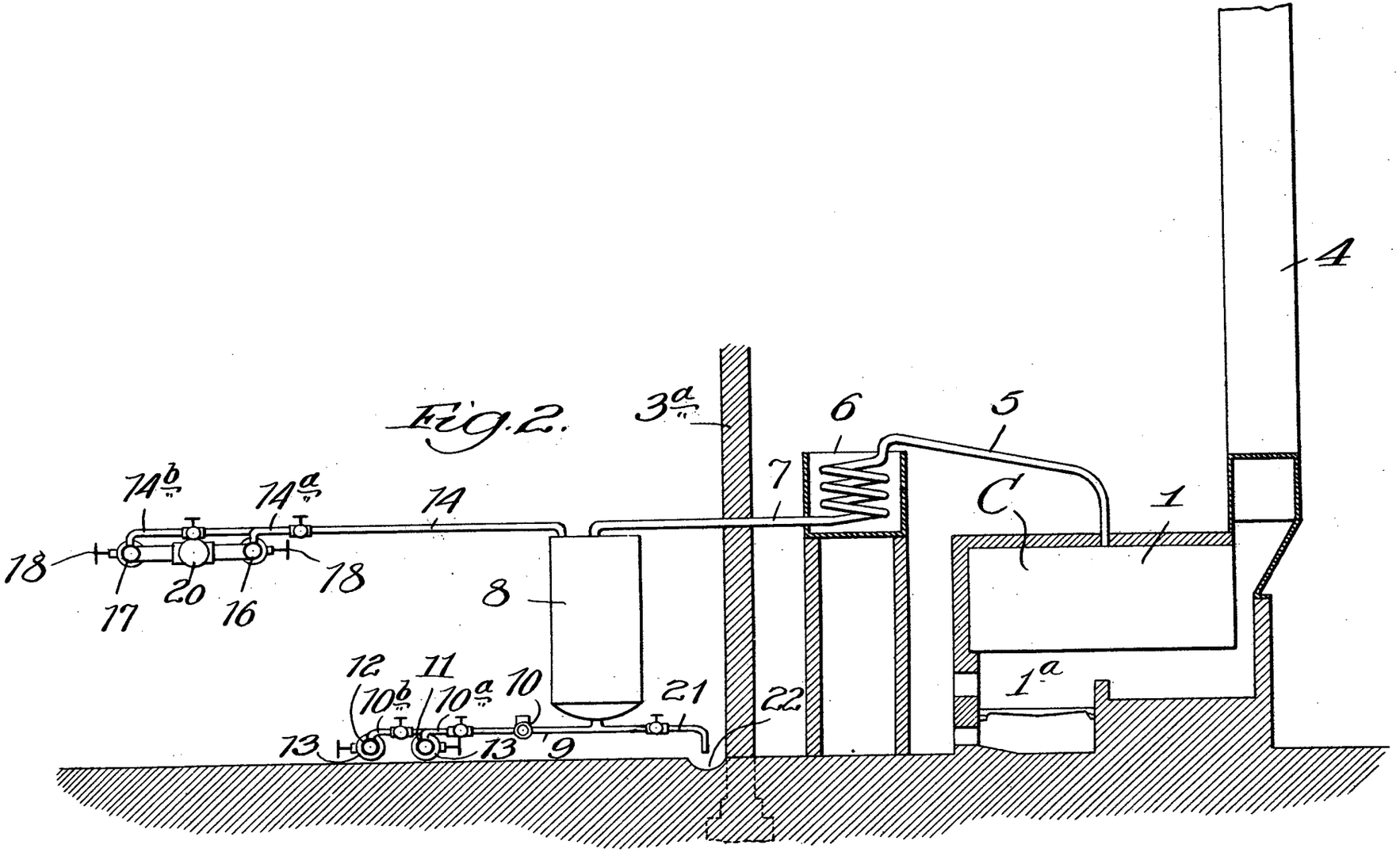
Fig. 2.
3a
6
5
4
7
C
1
14b
14a
14
18
18
17
20
16
18
8
12
11
10b
10a
10
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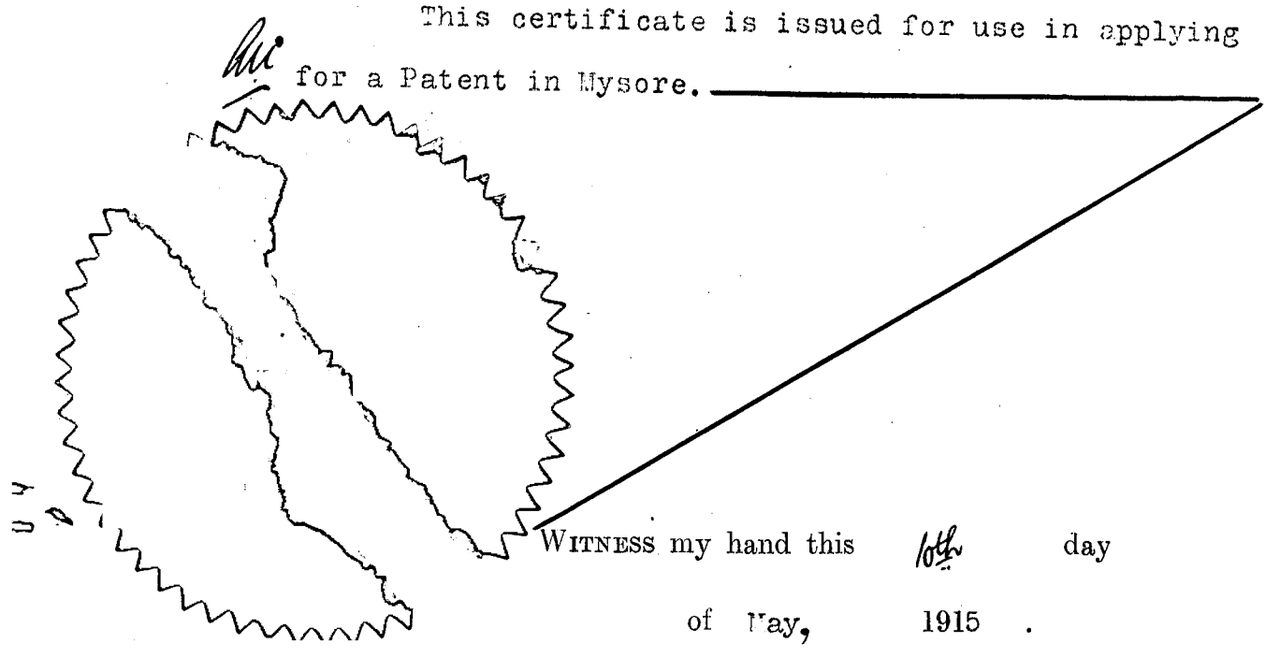
22
13
13
9
1a

Form P. Cert. 1.

# PATENTS AND DESIGNS ACT, 1907,

IT IS HEREBY CERTIFIED by the Comptroller-General of Patents, Designs and Trade Marks that the annexed are true copies of the complete specification and drawings as lodged on the 26th January, 1915, in connection with Wade's application (a communication to him by Standard Oil Company (Indiana), of Whiting, Lake County, Indiana, and of Chicago, Illinois, United States of America) for Patent No. 1,226 of 1915, filed on the 26th January, 1915.

This certificate is issued for use in applying for a Patent in Mysore.



WITNESS my hand this 10th day of May, 1915.

*Comptroller-General of Patents, Designs and Trade Marks.*

THE PATENT OFFICE,
25, SOUTHAMPTON BUILDINGS,
LONDON, W.C.

(91,768). Wt.41,874—3732. 2000. 2/14. A.&E.W.

93

1226

26 Jan 1915

"IMPROVED PROCESS OF AND APPARATUS FOR CONVERTING PETROLEUM OF A HIGH BOILING POINT INTO PETROLEUM OF A LOWER BOILING POINT"

--------(A communication from Standard Oil Company (Indiana) a corporation of the State of Indiana, Whiting, Lake County, Indiana and of 72 West Adams Street, Chicago, Illinois, United States of America)

I, HAROLD WADE, Chartered Patent Agent of 111 and 112, Hatton Garden, London, E.C. do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:-

This invention relates to improvements in the process and apparatus for converting petroleum of high boiling point into petroleum of lower boiling point as set forth in the specification of December 28th 1912 No 29862.

The specification referred to described a process for converting into light petroleum, such as gasoline, the residue of petroleum

distillation, such as gas oil or fuel oil which, under atmospheric pressure, will commence to vaporize at about 250° F. and will completely vaporize at a temperature of upward of 650° F. The process consists in distilling these residues under a pressure of upwards of three atmospheres thereby producing a range of temperature of about 650° F. to 850° F. Under these conditions of elevated pressure and temperature a large proportion of the gas oil or fuel oil is converted into petroleums of lower molecular weight.

The apparatus described in the patent specification referred to consists of a still having in direct communication therewith a condenser provided at its lower or discharge end with a pressure regulating valve in order to maintain the pressure in the still at the desired amount. When a still has just been charged the pressure therein is atmospheric and it is desirable to prevent the pressure rising until any contained water has been driven off. As soon, however, as the temperature rises to 250° F. indicating that all the water has been driven off, the valve at the lower end of the condenser is closed in order to allow the pressure in the still to be built up to the required value. It has been found, however, that the open communication between the still and the condenser makes it impossible to maintain and build up the desired

pressure in the still until after a considerable amount of petroleum has been distilled over either unconverted or else converted into unsaturated hydrocarbons of the olefine series. During the early stage of distillation the still pressure gradually rises owing to the production of non-condensible gases in the still. The volume of these gases is, however, small compared with the charge of oil in the still and is found to amount to only about 3% of the distillate, and it is found that upwards of 8% of the stock charged is distilled over before sufficient gas has collected in the apparatus to keep the pressure to the desired value. The product so distilled over is undesirable because, as experience has shown, at unduly low pressures only a low quality product can be produced.

The problem is therefore to prevent the condenser from unduly lowering the pressure below three atmospheres during the early part of the oil distillation process. Attempts have been made to build up and maintain the pressure in the still by means of a valve arranged between the still and its condenser which could be closed entirely until the desired pressure in the still has been reached, after which it could be opened sufficiently to allow distillation to take place under the same pressure. This method of

avoiding the pressure reducing effect of the condenser has been found impractical and undesirable particularly since the condensation then occurs without pressure and the light portions fail to condense at all, and each still must be separately regulated with extreme nicety.

According to the present invention this problem is solved owing to the fact that after any contained water has been driven off the pressure reducing effect of the condenser on the still is eliminated by adding to the vapor pressure of the distillate in the condenser the partial pressure of a sufficient quantity of non-condensible gases obtained from the same material in an advanced stage of distillation under elevated heat and pressure. This pressure regulation is very important, as not only does a slight drop in pressure seriously injure the product but a material rise entirely stops the flow of vapors and may produce temperatures and pressures high enough to endanger the apparatus.

Accordingly, the present method in using a battery of stills is to introduce under pressure a sufficient quantity of non-condensible gases produced by the distillation of the same material under elevated heat and pressure in other stills to raise the pressure in the freshly charged still and its condenser to that required for the efficient conversion of the fuel oil therein. The gases are introduced after they

have passed through the condensers and have been so freed from the gasoline and other condensible products with which they are mixed.

To facilitate the transfer of these gases to freshly charged stills each still in the battery is connected to a single header by means of valved connections. These valves are normally open so that free communication exists between the individual stills, thereby allowing the pressures to equalize automatically and enabling a single pressure controlling valve to control the pressures in all of the stills simultaneously.

Preferably, a second gas header is used which is under atmospheric pressure so that it can be used to conduct away the air driven by heat out of the stills while the water in the oil is being evaporated.

Similarly, two headers are preferably used for the condensed products, one of which is used for the high-grade products while the other is for the low-grade products yielded towards the end of the distillation process. Suitable valve connections are provided between the condensers or separating drums connected to such condensers and these headers. This arrangement also enables the pressures in the various stills to equalize automatically and so prevent harmful

variations in any one still.

Other features of the invention will be described in connection with the accompanying drawings in which:

Figure 1 illustrates diagrammatically, by a plan view, a battery of stills constructed and equipped in accordance with this invention; and

Figure 2 is a sectional elevation on the line 2 of Figure 1.

Four stills 1, denoted respectively A, B, C and D, are indicated by dotted representations and will suffice for the purposes of the explanation hereinafter given. These stills are shown under a shed 2, between walls 3, and they communicate with a stack 4, common to all, for carrying off products of combustion from the furnaces under the stills, one of these furnaces being represented at $1^a$ in Fig. 2. A vapor pipe 5 leads from the top of each still to the upper end of the water-cooled coil of a separate condenser 6, and from the bottom of each coil leads, through the inner wall $3^a$ of a housing, of which the side walls $3^b$ are shown, a pipe 7 for conducting the products of the condenser, composed of liquefied distillates and the light, gaseous products of distillation which have not yielded to the action of the condenser, into a separate drum 8 at the top of the latter. From the bottom of each drum leads a pipe 9 containing

a meter 10 for measuring the liquefied distillate and having two valved branches $10^a$ and $10^b$ which discharge, respectively, into header-pipes 11 and 12 closed at one end and containing similar shut-off valves 13 and $13^1$, respectively. These header-pipes discharge to storage-tanks (not shown). Each drum discharges gas from its upper end through a pipe 14 having two valved branches $14^a$ and $14^b$ leading, respectively, into header-pipes 16 and 17 which are closed at one end and contain similar shut-off valves 18 and $18^1$, respectively, these pipes which also lead to storage tanks (not shown), being connected by a pipe 19 containing a pressure relief valve 20 of any ordinary or suitable type.

At 21 is shown, leading from the bottom of each drum to a gutter 22, a valved pipe for drawing off the watery product of condensation of the vapors generated in the early part of the run.

For the purpose of explanation, let it be assumed that three of the stills 1, namely those denoted as A, B, and C, are running at the cracking temperature of upward of 650° F. and under a pressure of about 70 to 75 lbs. of the gases on the contents of the stills. The valves in branches $14^b$ connected with these three stills are open and the gases are discharged into the header-pipe 17 and are being held back by the partly closed valve $18^1$ in the latter and the relief valve 20, to produce the

required pressure of 70 to 75 lbs. in that header-pipe and throughout the apparatus of the running stills. The valves in the pipes 21 belonging to these three stills are closed, since all watery vapor from them has been distilled off before they reached the cracking temperature. The valves in branches $10^b$ are open and high-grade liquefied distillate is being discharged from the bottoms of the three respective condensers through the meters into the header-pipe 12 and through its partly open valve $13^1$ to storage. The rate of this discharge is regulated by the valve $13^1$, in the header-pipe 12 to maintain the required pressure throughout the apparatus and discharge the distillate as it is produced. The three stills thus running are all subject to the same pressure by reason of the valves in branches $14^b$ leading to the header-pipe 17 and the valves in branches $10^b$ leading to the header pipe 12 being open. These stills being connected by the header-pipes 17 and 12, give a sufficient volume of gas and liquid distillate to make the rate of their discharge easily controllable by the valves $18^1$ and $13^1$.

Let it also be assumed that the fourth still, denoted as D, has just been freshly charged and fired. The valve in pipe 21 and the valves in branches $10^a$, $10^b$ and $14^b$, belonging to that

still are closed, and the corresponding valve in branch $14^a$ is opened. The still D is thus closed to the 70 to 75 lbs. pressure maintained in the header-pipes 12 and 17, and is open only to the header-pipe 16, which conducts the gases to storage, or to the furnaces. The firing of this still is continued with resultant rise of temperature of its contents. At about 212° F. the watery portions of these contents are driven over through the respective condenser 6 into the drum communicating therewith. From time to time the valve in the respective pipe 21 is opened to discharge the water into the gutter 22. When the water has all been driven off, which is indicated by the temperature of the contents of the still D, the oil portion thereof will begin to distil over at about 250° F. To stop this distillation and the resultant production of low-grade distillate, the valve in the branch 14a belonging to the still D is closed and that in the corresponding branch $14^b$ is gradually opened. This allows the gas from the three other stills, that are running under a pressure of 70 to 75 lbs. in the header-pipe 17, to exert its pressure back through the branch $14^b$, belonging to still D, and the interposed equipment upon the contents of that still to stop the flow of vapors from the latter.

In this way the pressure upon the contents of the freshly-charged still is raised to that upon the stills A, B and C. The firing of still D is continued until the temperature of its contents is raised to upward of 650° F., when that still will begin to drive over its gases through the condenser, and drum and branch $14^b$ belonging to it, into the header-pipe 17, and the production of high-grade liquefied distillate will begin. The valve in branch $10^b$ is now opened and the high-grade distillate produced discharged into the header-pipe 12 in connection with that produced from the other running stills. The four stills are now running in conjunction all subject to the same control and the same pressure-influences. The sudden generation of excessive or dangerous pressure in one still is prevented by the connection of all through the header-pipes and open valves.

Let it ~~be~~ further be presumed that a still, say that denoted A, has completed its run and is ready to be drawn off, cleaned and freshly charged. Its furnace fire is drawn, and the valves in the branches $10^b$ and $14^b$ are closed, thereby shutting it off from the 70 to 75 lbs. pressure in the header-pipes 17 and 12 and from the influence of the stills B, C and D. The valve in the respective branch $14^a$ is slowly opened to permit the gas to pass through the

header-pipe 16 to storage or to the furnaces; and the valve in branch $10^a$ is also opened to permit low grade or inferior liquefied distillate produced after closing off the header-pipe 17 to pass through the header-pipe 11 to storage. As soon as the gas that was held under 70 to 75 lbs. pressure in the equipment belonging to still A has been discharged, the tar or residual contents of the still are drawn off and it is made ready to clean and receive a fresh charge. As will be understood, each still in a battery is handled in this way after completing its run.

HAVING NOW particularly described and ascertained the nature of the said invention and in what manner the same is to be performed as communicated to me by my foreign correspondents, I declare that what I claim is:-

1. An improvement in the process as set forth in which the gases produced by the distillation of the same material in an advanced stage of distillation under elevated heat and pressure are utilized in giving the initial pressure required to prevent fractional distillation in other stills.

2. An apparatus for carrying out the aforesaid process in which a battery of stills is used, all of which are connected to a common non-condensable gas header by separate valved

connections with the discharge ends of their respective condensers, for the purpose specified.

3. An apparatus for carrying out the aforesaid process in which a battery of stills is used having pressure equalizing connections with the discharge ends of their respective condensers and a single valve for controlling the gaseous pressure in all the stills, for the purpose specified.

4. An apparatus for carrying out the aforesaid process in which a battery of stills is used, each still having separate valved connections between the discharge ends of their respective condensers and a pair of distillate headers, whereby the low-grade distillate produced towards the end of the operation may be collected separately from the high-grade distillate.

5. A process for converting petroleums of high molecular weight into saturated petroleums of lower molecular weight substantially as set forth.

6. An apparatus for converting petroleums of high molecular weight into saturated petroleums of lower molecular weight constructed and adapted to operate substantially as described in connection with the accompanying drawings.

Dated this 26th day of January 1915.

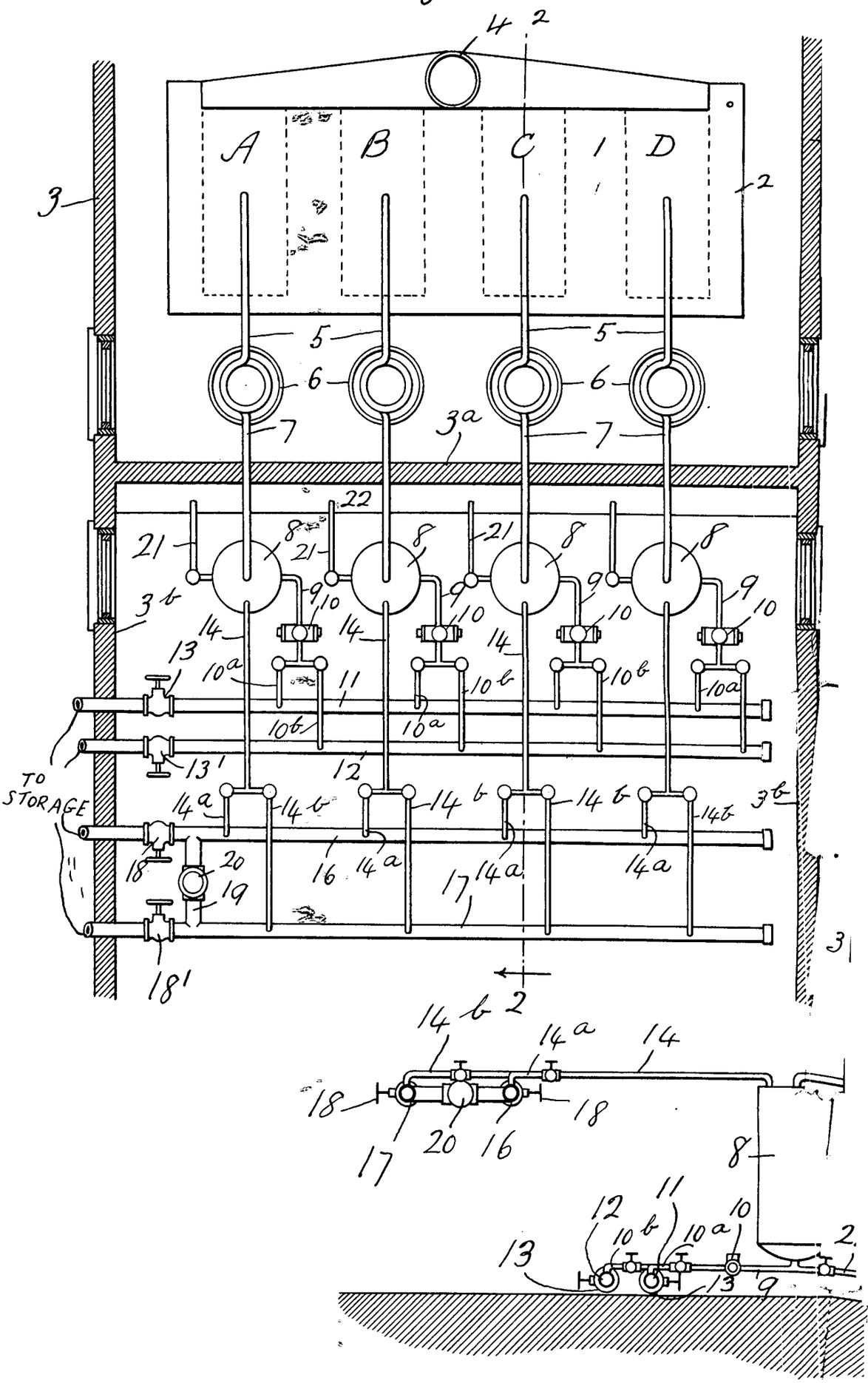
Boult Wade & Tennant

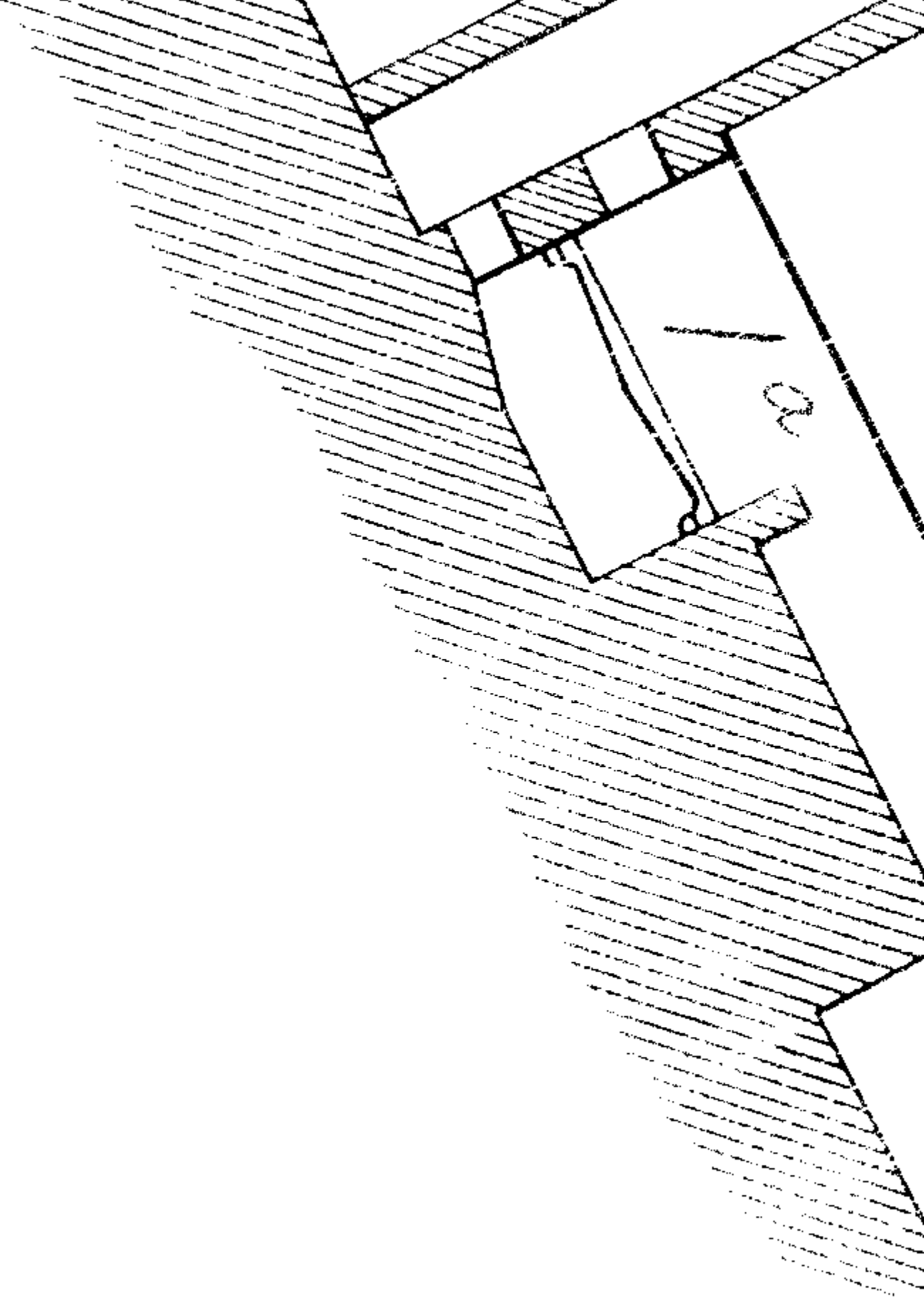
111 & 112, Hatton Garden, London, E.C.

Chartered Patent Agents.

A.D. 1915 Jan: 26th.
Wade's Comp. Speen

Fig - 1





3/

REGISTERED.

To

THE ~~CONTROLLER OF PATENTS~~, SECY TO THE GOVT OF MYSORE,
~~PATENT OFFICE~~, GENL & REV. DEPTS,
~~CALCUTTA.~~ BANGALORE,
MYSORE.

FROM
REMFRY & SON,
SOLICITORS AND PATENT AGENTS,
CALCUTTA.

Dated CALCUTTA, the 7th June 1915.

| DEPT. | P. | FILE L.R. | M. |
|---|---|---|---|
| FILE INDICATION | | | |
| Mysore Pats. | | | |

SIR,

DIARY No. 10948
1914-1915
Section Genl: Misc
No. 444-14
No. 2

re STAUDT & CO. (MYSORE)

(Brit. No. 1226/15 dated 26/1/15)

"Additional Still Pressure Case"

With reference to our letter dated 4/3/15 forwarding the above Application, we now beg to submit a Certified Copy of the British Complete Specification & Drawings No. 1226/15 dated 26/1/15, and request early issue of the Order granting leave to file Specifications herein.

We have the honour to be,

Sir,

Your very obedient servants.

Remfry & Son.

1 Enclo.

A.M.

P/O (Genl.) 1,000—4-2-14. [1,000—17-3-11]

Letter of
Mf
Br V Rep...

3 Dec 15

G.R.S. 26]

3017 Fin. V. Mf/578

SUBJECT.....

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.....513

*Diary No. of letter replied to* 10948

Section Gen : Mis
File No. 444-14
Serial No. 3

General and Revenue Secretariat

( )

*, the* *191* .

No. G. 1590/10 Rs/-

Date of issue 9th aug: 15

Signed by Sir Jas. N. Rao

To

The Dy Comm^r, Hy Deptt,

Bangalore.

Sir,

I am directed to forward herewith a sum of Rs 10/- received from Messrs Remfry & Son, Calcutta, being application fees payable under Cl (1) Schedule IV of the Mysore Inventions & Designs Regn XI of 1894, for leave to file a specification of an invention for "Improved process of and Apparatus for converting Petroleum of a high boiling point

over.

as
31/7/-

into Petroleum of a lower boiling point"
by the Standard Oil Co (Indiana), ~~Chicago~~,
and to request the favor of an
acknowledgment.

Yours &c,

[illegible]
Asst Secretary,
Genl Depot Mus

*List of enclosures.*

*Copied by*

*Examined by*

GPO–20,000–1-21-14

Power of Attorney & Cover ifo
WH
2/8/15

3 Affs

G.R.S. 26]

SUBJECT.....

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*Diary No. of letter replied to* 10948

Section Gen: Mis
File No. 444-14
Serial No. 14

General and Revenue Secretariat

( )

*, the* *191*

No. G. 15-91/ Zwo 2 No 24-

Date of issue 5th Aug: 15

Signed by Asst. Sec.

To

The Superintendent of Stamps.

Sir,

I am directed to forward herewith a deed of Assignment executed by Mr Edgar Milton Clark in favor of the Standard Oil Co, and a power of Attorney by the latter constituting messrs Rempfy & Son as their Agents in respect of the invention for "Improved process of and apparatus for converting Petroleum of a high boiling point into Petroleum

*over.*

of a lower boiling point" and to request
that the documents may each be
be impressed with the Mysore General
Stamp of the value of one Rupee Rs.2 herewith also sent
and returned to this Office.

I have &c,

[illegible]
[illegible]
for Secretary,
[illegible]

List of enclosures.

Copied by

Examined by

GPB—20,000—14-2-14

3 Dec 15

G.R.S. 26] 30/7

SUBJECT.....

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Diary No. of letter replied to 10948

Section Gen : Mis

File No. 444-14

Serial No. 5

General and Revenue Secretariat

( )

, the 191..

No. G. 1592/Two

Date of issue 5th aug: 15

To

The Dy. of Edn.

Signed by Lieut. R. Rau

Sir,

I am directed to forward herewith an application from the Standard Oil Co. for leave to file a specification of an invention for "Improved process of and apparatus for converting Petroleum of a high boiling point into Petrol of a lower boiling point" and to request that the opinion of Mr. E. Metcalfe, B.Sc., Professor of Physics, Central College, may be obtained

over.

as.
8/11

thereon under Sec 6 (2) of the Mysore Inventions & Designs Regn XI of 1894, and forwarded to this Office.

2. A certified copy of the British Complete Specification and Drawings No. 1226/15, of the 26th Jan.y 1915, received in respect of the invention ~~received from~~ is forwarded herewith for perusal and return.

I have &c,
Asst
29/7
For the Secretary,
Govt Debts Dept

*List of enclosures.*

*Copied by*

*Examined by*

GPB—20,000—1[illegible]

1335

55

1915-1916
G. M.
444-14
(6)

Rs. 1-0-0 Book No. 1059/387 No. 83

Bangalore Dist. **Treasury** dated 9th August 1915

Received from The Secretary to Government of Mysore
Several & Revenue Departments Bangalore.

Rupees One

Annas ——— and Pies ——— being on account of

the application fees received from Messrs Remfrey & Son
Calcutta under Sl (1) Schedule IV of the Mysore Inventions
and Designs Regulations of XI of 1894 received with docket
No: G.1590 dated 5-8-15
Genl 444-14-3

In charge of Treasury.
Treasurer
Bangalore District Treasury

DIARY NO. 1439

1914-1915
SECTION G. A.
FILE NO. 444-15
7

Stamp 19]

No. 4368
Enc. 2

OFFICE OF THE SUPERINTENDENT OF STAMPS IN MYSORE,
*Bangalore, Dated* 11 8 1915.

V
12/8

FROM
S. Krishnaswami Rao, ESQ., B.A., B.L.,
*Superintendent of Stamps in Mysore*

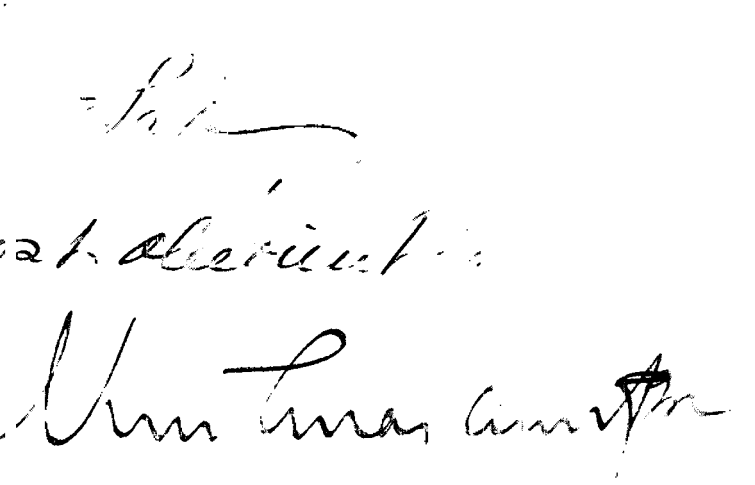
To
D. Sir Varadaraja Rao, ESQ. B.A., B.L.,
Secretary to the Government
of Mysore, General Department
Bangalore.

SIR,

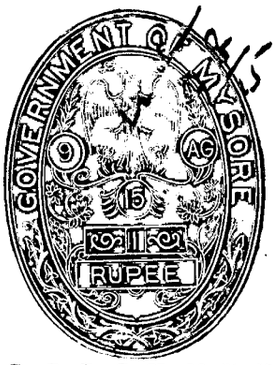
I have the honor to return herewith duly stamped, the two documents viz a deed of assignment and a power of attorney forwarded with your letter No G 1591/F.444-14-4 dated 5th instant and to request an acknowledgment

I have

GBPM—200—26-1-1915



Superintendent of Stamps
in Mysore.




# A S S I G N M E N T.

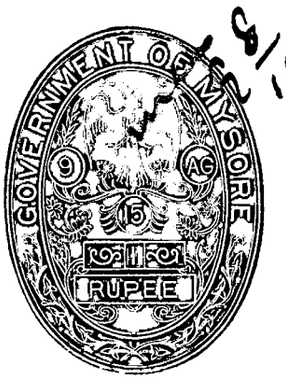
WHEREAS, I, EDGAR MILTON CLARK, of 824 Washington Street, Alton, Illinois, U. S. A., Superintendent of Works, have obtained Letters Patent in the United Kingdom No. 1226 dated the 26th day of January 1915 for an improvement in the Art of Petroleum Distillation; NOW THEREFORE KNOW YE that for and in consideration of the sum of Pounds Five to me in hand paid, the receipt whereof is hereby acknowledged, I, the said Edgar Milton Clarke, have assigned and transferred and by these presents do assign and transfer unto the STANDARD OIL COMPANY, an Indiana corporation, of Whiting, Indiana and Chicago, Illinois, U. S. A., Manufacturer, its successors, legal representatives and assigns, the whole right, title and interest in and to the said Letters Patent, and all and singular the liberties, powers, privileges and advantages whatsoever appertaining or belonging thereunto the same to be held and enjoyed by the said STANDARD OIL COMPANY, its successors and assigns for the full term for which such Letters Patent may be granted or any prolongation or extension thereof as fully and entirely as the same could have been held and enjoyed by me had this Assignment and sale not been made.

IN WITNESS whereof I, the said Edgar Milton Clark, have hereunto set my hand and seal this 14th day of November 1914.

Edgar Milton Clark (SEAL)

Signed, Sealed and Delivered at Chicago Illinois this 14th day of November, 1914, in the presence of

William Henry Dymond )
Edgar Dale Steele )




POWER OF ATTORNEY.

IN THE MATTER of the Inventions and Designs Regulation, 1894, of the Government of Mysore,

and

IN THE MATTER of the STANDARD OIL COMPANY, an Indiana corporation, of Whiting, Indiana and Chicago, Illinois, U. S. A., Manufacturer, assignee.

We, the above named STANDARD OIL COMPANY, do hereby retain, constitute and appoint REMFRY & SON, Solicitors and Patent Agents, of Calcutta, as our Agents and Attorneys to apply for and obtain from the Government of Mysore and keep in force an Exclusive Privilege or Letters Patent for an improvement in the Art of Petroleum Distillation, and we authorise them or either of them to sign our name to such papers and writings and do such acts regarding the same, including the appointment of a substitute or substitutes as may be necessary or expedient.

Dated this 14th day of November 1914.

ATTEST

George Black
SECRETARY.

STANDARD OIL COMPANY,
(OF INDIANA)

W P Conran
BY .....

Signed, Sealed and Delivered )
at Chicago, Illinois U.S.A. )
in the presence of: )

William Henry Dorenfeld
1508 No. 140 Dearborn Street
Chicago, Illinois, Lawyer

Edgar Dale Steele
140 S Dearborn St Chicago Ill
Manager.

60

Letter No.14417 dated 31st January/2nd February 1916, 574 from the Inspector-General of Education, to the Secretary to Government, General Department, Bangalore.

7041

14-15
G.M.
444-14

- - - - - -

8 With reference to your letters noted in the margin forwarding for favour of Mr. E. P. Metcalfe's opinion, certain applications for leave to file specifications of certain inventions, I have the honour to forward herewith copy of - letter dated the 28th instant from Mr. --- Metcalfe furnishing his opinion in the matter.

| | | | |
|---|---|---|---|
| X | X | X | : |
| X | X | X | : |
| X | X | X | : |
| G.No.1593/G.M.444-14-5 dated 5th August 1915 | | | : |

The applications received with the letters referred to above are returned herewith.

- - - - - - - -

" C O P Y "

Secretary to Government,
General Department.

GKV.4

Letter dated 28th January 1916 from E.P. Metcalfe, Esq., Niton, Palace Road, Bangalore, to the Inspector-General of Education in Mysore, Bangalore.

- - - - -

I have the honour to state that in my opinion leave may properly be given to file the specifications of the following inventions:--

X X X

X X X

Improved process of and apparatus for converting Petroleum of high boiling point into Petrol of low boiling point. (Standard Oil Co.)

X X X

- - - - - - - -

" C O P Y "

Secretary to Government,
General Department.

GKV.4

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2515

G. R. S. 26]

G.A. File No. 444-14
Serial No. 11

*Diary No. of letter replied to* .....

No. G 12894 / Mel

General and Revenue Secretariat
( )
, *the* 191 .

To

Messrs Remfry and Son,
Solicitors & Patent Agents
Calcutta.

Date of issue 15/3/16

Signed by Mr B S Rao

Gentlemen

With reference to your letter dated 4th March 1915, I am directed to forward herewith Govt. order No. G 12893 dated 15/3/16 authorizing the Standard Oil Company to file a specification of their invention for 'Improved process of and apparatus for converting Petroleum of high boiling

P.T. over.

SUBJECT.

17 Mar 16
11-3-16

point into Petroleum of lower boiling point" and to request that the fact may be intimated to the parties concerned.

I have &c

for Secy to Govt.,
Imp. Dept.

7/3/16

List enclosure

Copy for information forwarded by

GP[illegible]

Jm 444-14 D. 7700(a)

REGISTERED.

To

THE ~~CONTROLLER OF PATENTS~~, SECY TO THE GOVT OF MYSORE,
~~PATENT OFFICE,~~ GENL & REV DEPTS.,
~~CALCUTTA.~~ BANGALORE,
MYSORE.

FROM

REMFRY & SON,
SOLICITORS AND PATENT AGENTS,
CALCUTTA.

Jm 444-14-9

Dated CALCUTTA, the 24th February 1916.

| DEPT. | P. | FILE LR. | M. |
|---|---|---|---|
| FILE INDICATION | | | |
| Mysore Pats. (Genl) | | | |

SIR,

*re* STANDARD OIL CO. (MYSORE)

"Additional Still Pressure Case"

(Brit. *No.* 1226/15 *dated* 26/1/15.)

With reference to our letter of 7/6/15 forwarding a Certified Copy of the British Complete Specification & Drawings in this matter, we now beg to submit a Certified Copy of British Printed Specification & Drawings No. 1226/15, and solicit the favour of the issue of the Order granting Leave to file Specifications herein at a very early date.

We have the honour to be,

Sir,

Your very obedient servants,

Remfry & Son

1 Enclo:-
c/Copy Brit.P/Specn 1226/15.

I.M.B.

P/O (Genl.) 1,000—4-2-14. [1,000—17-3-11]

I Certify this, including the Drawing forming part thereof, to be a true Copy.

31 DEC 1915

Acting for Comptroller.

N° 1226 A.D. 1915

Date of Application, 26th Jan., 1915—Accepted, 2nd Dec., 1915

COMPLETE SPECIFICATION.

# Improved Process of and Apparatus for Converting Petroleum of a High Boiling Point into Petroleum of a Lower Boiling Point.

(A communication from STANDARD OIL COMPANY (INDIANA), a corporation of the State of Indiana, Whiting, Lake County, Indiana, and of 72, West Adams Street, Chicago, Illinois, United States of America.)

I, HAROLD WADE, Chartered Patent Agent, of 111 & 112, Hatton Garden, London, E.C., do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In the treatment of heavy residues to obtain more or less light oils suitable for illuminating and other purposes, it has been proposed to arrange the boiler or retort and condenser in free communication with one another without interposing any valve between them. In this known process the space in the boiler or retort and condenser not occupied by liquid was kept charged under considerable pressure with the gases obtained from the distillation itself.

According to the present invention, a battery of two or more stills is employed and discharges the products of distillation into a common receiver; but after one or more of the stills are in operation, additional stills of the battery cannot discharge into the receiver until an initial pressure is produced in the said additional stills by the gases formed from the distillation of similar material in an advanced stage of distillation under elevated heat and pressure in the still or stills already in operation.

This invention is particularly suitable for use in connection with the process described in Specification No. 29,862 of 1912, which refers to a process for converting into light petroleum, such as gasoline, the residue of petroleum distillation, such as gas oil or fuel oil which has a boiling point of upwards of 500° F. The prior process consists in distilling these residues under a pressure of about 4 to 5 atmospheres at a temperature of from 650° F. to 850° F. Under these conditions of elevated pressure and temperature, a large proportion of the gas oil or fuel oil is converted into petroleum of lower molecular weight.

The apparatus described in the patent specification referred to consists of a still having in direct communication therewith a condenser provided at its lower or discharge end with a pressure regulating valve in order to maintain the pressure in the still at the desired amount. When a still has just been charged the pressure therein is atmospheric and it is desirable to prevent the pressure rising until any contained water has been driven off. As soon, however, as the temperature rises to 250° F. indicating that all the water has been driven off, the valve at the lower end of the condenser is closed in order to allow the pressure in the still to be built up to the required value. It has been found, however, that the open communication between the still and the condenser makes it impossible to maintain and build up the desired pressure in the still until after a considerable amount of petroleum has been distilled over either unconverted or else converted into unsaturated hydrocarbons of the olefine series,

*Converting Petroleum of High Boiling Point into Petroleum of Lower Boiling Point.*

During the early stage of distillation the still pressure gradually rises owing to the production of non-condensible gases in the still. The volume of these gases is, however, small compared with the charge of oil in the still and is found to amount to only about 3%, of the distillate, and it is found that upwards of 8% of the stock charged is distilled over before sufficient gas has collected in the apparatus to keep the pressure to the desired value. The product distilled over is undesirable because, as experience has shown, at unduly low pressures only a low quality product can be produced.

The problem is therefore to prevent the condenser from unduly lowering the pressure below three atmospheres during the early part of the oil distillation process. Attempts have been made to build up and maintain the pressure in the still by means of a valve arranged between the still and its condenser which could be closed entirely until the desired pressure in the still has been reached, after which it could be opened sufficiently to allow distillation to take place under the same pressure. This method of avoiding the pressure reducing effect of the condenser has been found impracticable and undesirable particularly since the condensation then occurs without pressure and the light portions fail to condense at all, and each still must be separately regulated with extreme nicety.

The present invention solves this problem, by using a battery of stills and introducing under pressure a sufficient quantity of non-condensible gases produced by the distillation of the same material under elevated heat and pressure in other stills of the battery to raise the pressure in the freshly charged still and its condenser to that required for the efficient conversion of the fuel oil therein. The gases are introduced after they have passed through the condensers and have been so freed from the gasoline and other condensible products with which they are mixed.

To facilitate the transfer of these gases to freshly charged stills each still of the battery is connected to a single header by means of valved connections. These valves are normally open so that free communication exists between the individual stills, thereby allowing the pressures to equalize automatically and enabling a single pressure controlling valve to control the pressures in all of the stills simultaneously.

Preferably, a second gas header is used which is under atmospheric pressure so that it can be used to conduct away the air driven by heat out of the stills while the water in the oil is being evaporated.

Similarly, two headers are preferably used for the condensed products, one of which is used for the high-grade products while the other is for the low-grade products yielded towards the end of the distillation process. Suitable valved connections are provided between the condensers or separating drums connected to said condensers and these headers. This arrangement also enables the pressures in the various stills to equalize automatically and so prevent harmful variations in any one still.

Other features of the invention will be described in connection with the accompanying drawings in which:

Figure 1 illustrates diagrammatically, by a plan view, a battery of stills constructed and equipped in accordance with this invention; and

Figure 2 is a sectional elevation on the line 2 of Figure 1.

Four stills 1, denoted respectively A, B, C and D, are indicated by dotted representation and will suffice for the purposes of the explanation hereinafter given. These stills are shown under a shed 2 between walls 3, and they communicate with a stack 4, common to all, for carrying off products of combustion from the furnaces under the stills, one of these furnaces being represented at F in Fig. 2. A vapor pipe 5 leads from the top of each still to the upper end of the water-cooled coil of a separate condenser 6, and from the bottom of each coil leads, through the inner wall $3^a$ of a housing, of which the side walls 3 are shown, a pipe 7 for conducting the products of the condenser

composed of liquefied distillates and the light, gaseous products of distillation which have not yielded to the action of the condenser, into a separate drum 8 at the top of the latter. From the bottom of each drum leads a pipe 9 containing a meter 10 for measuring the liquefied distillate and having two valved branches $10^a$ and $10^b$ which discharge, respectively, into header-pipes 11 and 12 closed at one end and containing similar shut-off valves 13 and $13^1$, respectively. These header-pipes discharge to storage-tanks (not shown). Each drum discharges gas from its upper end through a pipe 14 having two valved branches $14^a$ and $14^b$ leading, respectively, into header-pipes 16 and 17, which are closed at one end and contain similar shut-off valves 18 and $18^1$, respectively, these pipes which also lead to storage-tanks (not shown), being connected by a pipe 19 containing a pressure relief valve 20 of any ordinary or suitable type. At 21 is shown, leading from the bottom of each drum to a gutter 22, a valved pipe for drawing off the watery product of condensation of the vapors generated in the early part of the run.

For the purpose of explanation, let it be assumed that three of the stills 1, namely those denoted as A, B, and C, are running at the cracking temperature of upward of 650° F. and under a pressure of about 70 to 75 lbs. of the gases on the contents of the stills. The valves in branches $14^b$ connected with these three stills are open and the gases are discharging into the header-pipe 17 and are being held back by the partly closed valve $18^1$ in the latter and the relief valve 20, to produce the required pressure of 70 to 75 lbs. in that header-pipe and throughout the apparatus of the running stills. The valves in the pipes 21 belonging to these three stills are closed, since all watery vapor from them has been distilled off before they reached the cracking temperature. The valves in branches $10^b$ are open and high-grade liquefied distillate is being discharged from the bottoms of the three respective condensers through the meters into the header-pipe 12 and through its partly open valve $13^1$ to storage. The rate of this discharge is regulated by the valve $13^1$ in the header-pipe 12 to maintain the required pressure throughout the apparatus and discharge the distillate as it is produced. The three stills thus running are all subject to the same pressure by reason of the valves in branches $14^b$ leading to the header-pipe 17 and the valves in branches $10^b$ leading to the header-pipe 12 being open. These stills being connected by the header-pipes 17 and 12, give a sufficient volume of gas and liquid distillate to make the rate of their discharge easily controllable by the valves $18^1$ and $13^1$.

Let it also be assumed that the fourth still, denoted as D, has just been freshly charged and fired. The valve in pipe 21 and the valves in branches $10^a$, $10^b$ and $14^b$, belonging to that still are closed, and the corresponding valve in branch $14^a$ is opened. The still D is thus closed to the 70 to 75 lbs. pressure maintained in the header-pipes 12 and 17, and is open only to the header-pipe 16, which conducts the gases to storage, or to the furnaces. The firing of this still is continued with resultant rise of temperature of its contents. At about 212° F. the watery portions of these contents are driven over through the respective condenser 6 into the drum communicating therewith. From time to time the valve in the respective pipe 21 is opened to discharge the water into the gutter 22. When the water has all been driven off, which is indicated by the temperature of the contents of the still D, the oil portion thereof will begin to distil over at about 250° F. To stop this distillation and the resultant production of low-grade distillate, the valve in the branch $14^a$ belonging to the still D is closed and that in the corresponding branch $14^b$ is gradually opened. This allows the gas from the three other stills, that are running under a pressure of 70 to 75 lbs. in the header-pipe 17, to exert its pressure back through the branch $14^b$, belonging to still D, and the interposed equipment upon the contents of that still to stop the flow of vapors from the latter. In this way the pressure upon the contents of the freshly-charged still is raised to that upon the stills A, B and C. The firing of still D is continued until the temperature of its contents

is raised to upward of 650° F., when that still will begin to drive over its gases through the condenser, and drum and branch 14b belonging to it, into the header-pipe 17, and the production of high-grade liquefied distillate will begin. The valve in branch 10b is now opened and the high-grade distillate produced discharges into the header-pipe 12 in connection with that produced from the other running stills. The four stills are now running in conjunction, all subject to the same control and the same pressure-influences. The sudden generation of excessive or dangerous pressure in one still is prevented by the connection of all through the header-pipes and open valves.

Let it further be presumed that a still, say that denoted A, has completed its run and is ready to be drawn off, cleaned and freshly charged. Its furnace-fire is drawn, and the valves in branches 10b and 14b are closed, thereby shutting it off from the 70 to 75 lbs. pressure in the header-pipes 17 and 12 and from the influence of the stills B, C and D. The valve in the respective branch 14a is slowly opened to permit the gas to pass through the header-pipe 16 to storage or to the furnaces; and the valve in branch 10a is also opened to permit low grade or inferior liquefied distillate produced after closing off the header-pipe 17 to pass through the header-pipe 11 to storage. As soon as the gas that was held under 70 to 75 lbs. pressure in the equipment belonging to still A has been discharged, the tar or residual contents of the still are drawn off and it is made ready to clean and receive a fresh charge. As will be understood, each still in a battery is handled in this way after completing its run.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, as communicated to me by my foreign correspondents, I declare that what I claim is:—

1. A process for the treatment of fuel oil or other liquid hydrocarbons, in which a battery of two or more stills is employed and the gases produced in one or more of the stills by the distillation of the hydrocarbon in an advanced stage of distillation under elevated heat and pressure are used to give the initial pressure required to prevent fractional distillation in other stills of the battery.

2. An apparatus for carrying out the process set forth in Claim 1 in which a battery of stills is used, all of which are connected to a common non-condensable gas header by separate valved connections with the discharge ends of their respective condensers, for the purpose specified.

3. An apparatus for carrying out the process set forth in Claim 1 in which a battery of stills is used having pressure equalizing connections with the discharge ends of their respective condensers and a single valve for controlling the gaseous pressure in all the stills, for the purpose specified.

4. An apparatus for carrying out the process set forth in Claim 1 in which a battery of stills is used, each still having separate valved connections between the discharge ends of their respective condensers and a pair of distillate headers, whereby the low-grade distillate produced towards the end of the operation may be collected separately from the high-grade distillate.

5. The process for converting in two or more stills petroleums of high molecular weight into saturated petroleums of lower molecular weight substantially as set forth.

6. The apparatus for converting petroleums of high molecular weight into saturated petroleums of lower molecular weight constructed and adapted to operate substantially as described in connection with the accompanying drawings.

Dated this 26th day of January, 1915.

BOULT, WADE & TENNANT,
111 112, Hatton Garden, London, E.C.,
Chartered Patent Agents.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd. 1915.

A.D. 1915. JAN. 26. № 1226.
WADE'S COMPLETE SPECIFICATION.



[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

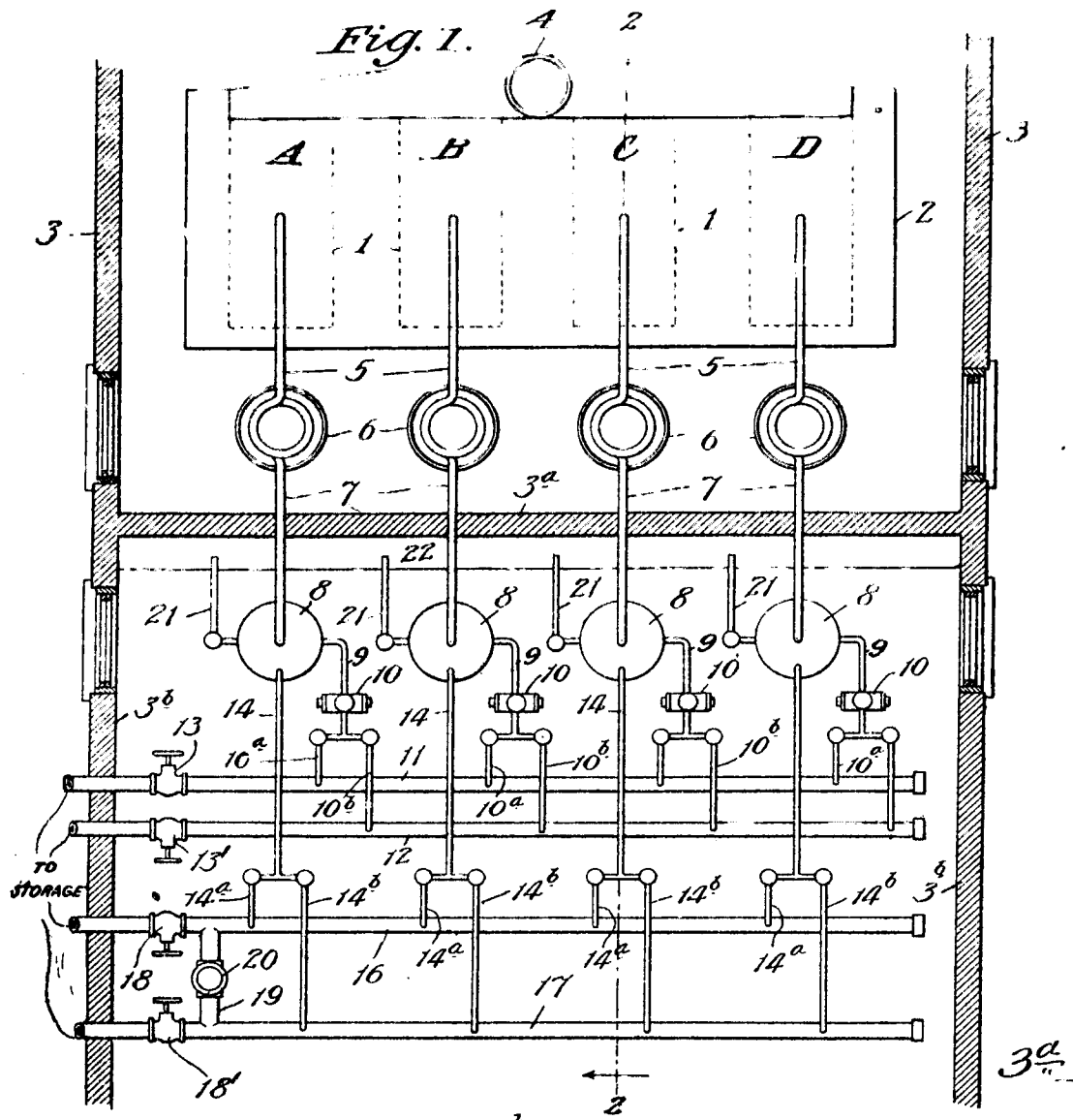
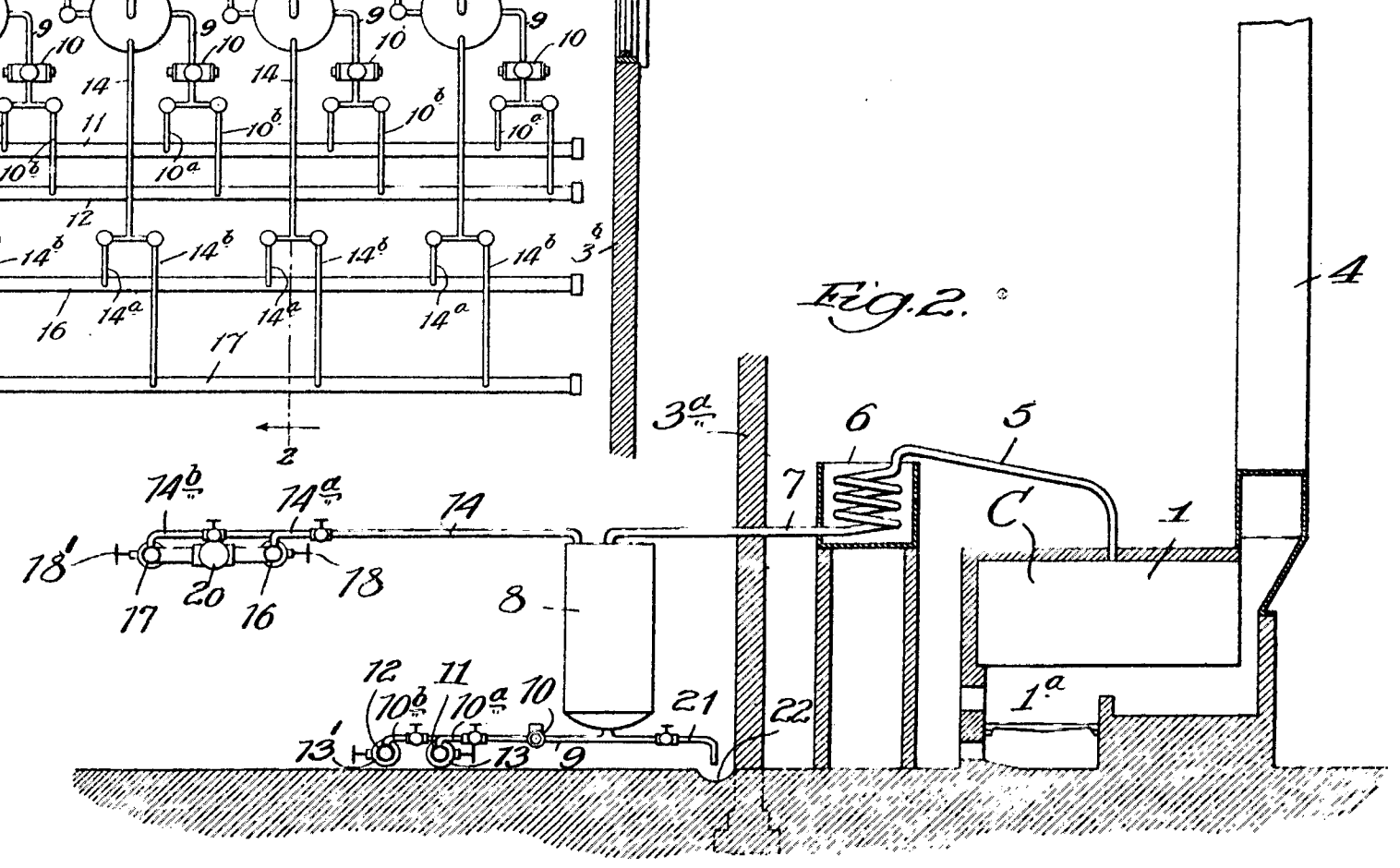



Fig. 2.



Malby & Sons, Photo-Litho

ARY NO. 8483

REGISTERED.

1914 15

To

THE ~~CONTROLLER OF PATENTS~~, SECY. TO THE GOVT. OF MYSORE,
PATENT OFFICE, GENL & REV. DEPTS,
CALCUTTA. BANGALORE,
MYSORE

444-15-12

FROM

REMFRY & SON,
SOLICITORS AND PATENT AGENTS,
CALCUTTA.

Dated CALCUTTA, the 23rd March 1916.

| DEPT. | P. | FILE LR. | M. |
|---|---|---|---|
| FILE INDICATION | | | |
| Mysore Pats (Genl) | | | |

SIR,

*re* STANDARD OIL COMPANY. (MYSORE) "Additional Still Pressure Case".

*No.* 17/14-15 *dated* - -

(Brit No. 1226/15 dated 26/1/15)

Pursuant to the Order granting leave in this matter dated 15th March 1916, Register No. 17 of 1914-15, we have the honour to forward herewith 4 copies of the Specification of STANDARD OIL COMPANY, (Indiana) a Corporation of the State of Indiana, Whiting, Lake County, Indiana and of 72, West Adams Street, Illinois, United States of America, Manufacturer, in respect of their Invention for "IMPROVED "PROCESS OF AND APPARATUS FOR CONVERTING PETROLEUM OF A "HIGH BOILING POINT INTO PETROLEUM OF A LOWER BOILING "POINT".

The abovementioned Order is enclosed and we solicit the favour of your filling in the Certificate at foot thereof and having same signed.

A Post Office Order for Rs. 30/- is sent today.

We have the honour to name our Office in Calcutta to the Address for Service under the Act.

We have the honour to be,
Sir,
Your very obedient servants,

Remfry & Co

Enclos :-
4 Specns.
Order.

P/O (Genl.) 1,000—4-2-14. [1,000—17-3-11]
A. M.

1/21 85/3

G. R. S. 26]

File No. 444-14

Serial No. 13

*Diary No. of letter replied to* 8483

No. G/13780/3

General and Revenue Secretariat

( )

*, the* 191 .

To

Messrs Rempry & Sons,

Calcutta

Date of issue 2/4/16

Signed by M B L Rao

Gentlemen,

With reference to your letter G 23-3-16

I am directed to state that of the

four copies received of the Specifications of the

Standard Oil Co., in respect of their invention

for 'Improved process of and apparatus

for converting petroleum of a high boiling

point into petroleum of a lower boiling

point' received therewith, only one is

signed. I am therefore to return the other

P.T.O. over.

SUBJECT.

Copied by

Examined by

GPO—20.0 —10-10. 4

T/ 69
CS/4F

64

To

THE ~~CONTROLLER OF PATENTS~~, SECY TO THE GOVT OF MYSORE,
~~PATENT OFFICE~~, GENL & REV. DEPTS,
~~CALCUTTA~~. BANGALORE,
MYSORE.

FROM

REMFRY & SON,
SOLICITORS AND PATENT AGENTS,
CALCUTTA.

DIARY NO. 9154
15-4-16
G.M.
G.M. 444-14
14

Dated CALCUTTA, the 15th April 1916.

| DEPT. | P. | FILE LR. | M. |
|---|---|---|---|
| FILE INDICATION | | | |
| Mysore Pats (Genl). | | | |

SIR,

re STANDARD OIL COMPANY, (MYSORE) "Additional Still Pressure Case"

*No.*17/14-15 *dated* - -
(Brit No.1226/15 dated 26/1/15)

With reference to your Letter No.G13780/G.M.444-14-13/3 dated 4/3/16 (should be 4/4/16) returning 3 copies of the Specification in the above matter transmitted with our letter of 23/3/16 to be signed, we beg to resubmit such Copies of Specification and to request that they be accepted and filed without our having to send same to the United States of America for signature by the Applicant Company.

We beg to point out that it is not the practice in the British Patent Office or in the Indian Patent Office to insist upon copies of Specifications but only upon the original Specification being signed and, on reference to the Mysore Inventions & Designs Regulation 1894, it would appear that it is the intention of such Regulation that the like practice shall prevail in the Mysore Patent Office inasmuch as such Regulation refers to a Specification i.e., the original Specification, and Sec. 11 does not provide that the ~~C~~opies of the Specification shall be signed.

We have the honour to be,
Sir,
Your very obedient servants,

Remfry & Son

3 Enclos :-
3 c/Specns.

A.M.

P/O (Genl.) 1,000—4-2-14. [1,000—17-3-11]

17/5

G. R. S. 26]

G.M File No. 444-14
Serial No. 45

*Diary No. of letter replied to* 9154

No. G 15660/3

General and Revenue Secretariat
( )
, *the* 191 .

**To**

Messrs Remfry & Son

Solicitors & Patent Agents, Calcutta

Date of issue 18th May 1916

Signed by Mr. T.E. Jagannayagi Sir;

With reference to your letter of 15th April 1916, I am directed to state that the Copies of the Specification of the Standard Oil Company in respect of their invention for 'Improved Process of and apparatus for Converting petroleum of a high boiling point into petroleum of a lower boiling point' require a Certificate that the documents are correct

P.T.O.

SUBJECT.

or true copies, and accordingly I
request that the three copies, herewith
returned, may be attested by you
as the Agent of the Applicant Company
& returned first to this office.

I have &c

[illegible]
For Jones & Co's
Ind. Agts.

*List of enclosures*

*Copied by*

*Examined by*

GPE—20,000—10/15

F. 13/6/13

10706
14-15
GM.
444-14
16

REGISTERED.

To

THE ~~CONTROLLER OF PATENTS~~, SECY TO THE GOVT OF MYSORE,
~~PATENT OFFICE~~, GENL. & REV. DEPTS.,
~~CALCUTTA~~. BANGALORE,
MYSORE.

FROM

REMFRY & SON,
SOLICITORS AND PATENT AGENTS,
CALCUTTA.

Dated CALCUTTA, the 9th June 1916.

| DEPT. | P. | FILE LR. | M. |
|---|---|---|---|
| FILE INDICATION | | | |
| Mysore Pats. (Genl) | | | |

SIR,

*re* STANDARD OIL CO. (MYSORE) "Additional Still Pressure Case"

*No.* M/14-15 *dated* 9/ - / -
(Brit No. 1226/15 dated 26/1/15.)

In compliance with the request contained in your Letter No. G.15660/G.M.444-14-15/3 dated 18/5/16, we beg to resubmit herewith 3 copies of the Specification herein endorsed by us "True Copy. Remfry & Son, Agents for the Applicant Company", and await early issue of the Original Order with Certificate of filing of Specifications.

We have the honour to be,

Sir,

Your very obedient servants,

Remfry & Son

I.M.B.

[Genl.) 1,000—4-2-14. [1,000—17-3-11]

No. G 12 893 / G.H. 444-14-10.

GOVERNMENT OF MYSORE

# General Department.

Register No. 17 of 1914-15

*Bangalore, the* 15th/3/16 1916.

WHEREAS an application, dated the 14th November 1914 and received on the 8th March 1915, has been submitted under Section 5 of the Mysore Inventions and Designs Regulation, 1894, by the Standard Oil Company, an Indiana Corporation, of Whiting, Indiana and Chicago, Illinois, United States of America,

(hereinafter referred to as "the applicant") for leave to file a specification of an invention for "Improved process of and apparatus for converting Petroleum of a high boiling point into Petroleum of a lower boiling point".

And whereas the applicant has duly complied with all the requirements of Section 5 of the said Regulation;

The Government of Mysore are pleased, under Section 6 of the said Regulation, to authorize the applicant to file a specification of the said invention in accordance with the provisions of the said Regulation.

ORDERED, that the applicant be, and he is hereby, informed accordingly.

By Order of the Government of Mysore,

~~For~~ *Secretary to the Govt. of Mysore,*
*Gen. ~~and Rev.~~ Depts.*

Certified that the fees prescribed in the fourth schedule to the Mysore Inventions and Designs Regulation, 1894, in respect of the application for leave to file the said specification and of the filing thereof have been paid by the applicant, and that the specification hereinbefore described has been duly filed in accordance with the provisions of Section 8 of the said Regulation on this the twenty-seventh day of March 1916.

~~For~~ *Secretary to the Govt. of Mysore,*
*Gen. ~~and Rev.~~ Depts.*

*(Section 8 of the Inventions and Designs Regulation, 1904.)*

8. (1) If within six months from the date of an order under Section 6, Sub-Section (.), or within such further time, not exceeding three months, as the Government of Mysore, in its discretion, may, on cause shown to its satisfaction and on payment of the fee prescribed in that behalf in the fourth schedule, see fit to allow, the applicant causes a specification of his invention to be filed in manner by this Part required, and the fee prescribed in the fourth schedule in respect of the filing of the specification to be paid, the applicant shall, subject to the other provisions of this Part, be entitled to the exclusive privilege of making, selling and using the invention in the Territories of Mysore, and of authorizing others so to do, for a term of fourteen years from the date of the filing of the specification.

(2) But an exclusive privilege in respect of an invention of a new manufacture shall, notwithstanding anything in Sub-Section (1), cease, if the inventor fails to pay, within the time limited in that behalf by the fourth schedule, any fee prescribed in that schedule in respect of the continuance of the privilege.

(3) If, nevertheless, in any case, by accident, mistake, or inadvertence, an inventor fails to pay any such fee within the time so limited, he may apply to the Government of Mysore for an enlargement of the time for making the payment.

(4) Thereupon the Government of Mysore may enlarge the time accordingly, on payment of the fee prescribed in that behalf in the fourth schedule, and subject to the following conditions, namely :

(*a*) the time for making a payment shall not in any case be enlarged for more than three months ; and

(*b*) if any suit is instituted in respect of an infringement of the exclusive privilege committed after a failure to make a payment within the time limited for the making thereof and before the enlargement of that time, the Court disposing of the suit may, if it thinks fit, refuse to award or give any damages in respect of the infringement.

GPB—500—7-4-09.

G. R. S. 26]

4 dfts
money + cert today
27/6/96

SUBJECT.....

.....

.....

*Diary No. of letter replied to* 10706

Section GM.
File No. 444-14
Serial No. 17

General and Revenue Secretariat
( )
, *the* 191 .

No. G 12041/Rs 30-

Date of issue 23. 6. 96

To
The Treasury officer
Bangalore District Treasury.

Signed by Mr. S. Jagadeesa Aiyer

Has the honor to forward herewith the sum of Rs. 30/- (Thirty only) received from Messrs Remfry & Son, Calcutta, being the fee payable under clause 2 of schedule IV of the Inventions & Designs Regulation XI of 1894, for leave to file a specification of an invention for "Improved process of and apparatus for converting Petroleum

Over.

24/6
17/6 Lw

of a high boiling point into —
petroleum, or lower boiling point"
by the Standard Oil Co. Indiana,
and to request an acknowledgment
of the receipt of the amount.

B. O

For Secy of H.G.N.R
Genl. Supt.

List of enclosures

Copied by

Examined by

4 of 5

2 Copies

MYSORE GOVT; GEN. & REV. SECRETARIAT,

No. G 17042/GM.244-14-15 Dated Bangalore, 23rd June 1916.

# NOTIFICATION.

(PATENT.)

The following specification of an invention has been filed in accordance with Sections 8, 9, 10 and 11 of Regulation XI of 1894 (The Inventions and Designs Regulations) and is open to inspection at the Mysore Government Secretariat on application to the Secretary to the Government of His Highness the Maharaja of Mysore, General ~~and Revenue~~ Departments, and on payment of a fee of one Rupee.

By the Standard Oil Company, an Indiana Corporation of Whiting, Indiana and Chicago, Illinois, United States of America.

"Improved process of and apparatus for converting Petroleum of a high boiling point into petroleum of a lower-boiling point"

By Order,

For Secretary to Govt
Genl. Depts.

To

The Compiler, *Mysore Gazette*, for publication.

15

4 of 5

MYSORE GOVT. GEN. & REV. SECRETARIAT

No. 917043/2/G.M.LL-14-19 *Dated Bangalore,* 23-6 1916.

*From*

*The Secretary to the Government of H. H. the Maharaja of Mysore,*
*General ~~and Revenue~~ Departments.*

To

Messrs Remfry & Son,
Solicitors & Patent Agents, Calcutta

Gentlemen
~~Sir,~~

(Correspondence ending with)

With reference to your letter dated 9th June 1916, I am directed to forward copy of a Notification No. 917042 dated 23.6.1916 issued by this Government in regard to the invention filed by you under Regulation XI of 1894 (The Inventions and Designs Regulations.) and to request that the fact may be communicated to the parties concerned.

The order granting permission to file specification is herewith returned, with the certificate at foot, duly filled in and signed.

I have the honor to be,
Sir,
Your most obedient servant,

For Secretary to Govt
Genl. Dept.

Dft.
Recd

4 In

1616

405

G. R. S. 26]

SUBJECT.....

.....

.....

*Diary No. of letter replied to* 1076

Section GM.

File No. ~~444~~ 14

Serial No. 20.

General and Revenue Secretariat

( )

*, the* *191*

No. G 17044-6/M2

Date of issue 23. 6. 916

To The D.G. of Education in Mysore

" Chief Engineer of Mysore

" Supdt. Govt Museum

Signed by Mr. K Ranganaikar

Has the honor to forward herewith for record in his office, a copy of the specification of an invention for 'Improved process of and apparatus for converting petroleum of a high boiling point into petroleum of a lower boiling point' by the Standard Oil Co. Indian of Tower.

and to request the favour of an
acknowledgment.

By order

for Secy & Genl
Genl. Depot.

List of enclosures

Copied by

Examined by

[illegible] 20,000 [illegible]

No. 241.

Mysore Government Museum.

Bangalore. Dated 26th June 1916

DIARY NO. 11092

From

The Superintendent,

Government Museum.

B a n g a l o r e.

19/4-1915
SECTION G.M.
FILE NO. 444-11
SECTION
21

To

The Secretary to the Government of

H.H. the Maharaja of Mysore..

General Department.

B a n g a l o r e.

Sir,

I have the honor to acknowledge with thanks the receipt of a copy of the specification of an invention for ' Improved process of and apparatus for converting petroleum of a high boiling point into petroleum of a lower boiling point ' by the Standard Oil Company, Indiana, kindly forwarded with your docket No. G 17044-6/ G.M.444-14-20 dated 23rd June 1916.

I have the honor to be,

S i r,

Your most obedient servant,

Offg. Superintendent.

W.D. 0241—GPB—6.00

191[illegible].

From [illegible]

To [illegible]

Dated [illegible]

Despatched [illegible]

Received

General No.
No.

Enclosure No.

DIARY NO. 352

GPB—3,210—1-6-15

Edn.'15]

OFFICE OF INSPECTOR-GENERAL OF EDUCATION IN MYSORE.

1916 - 15

444-14

No. 792
---
14

*Bangalore,* 5th July, *1916.*

*From*

Rao Bahadur
M. SHAMA RAO, ESQ., M.A.,
*Inspector-General of Education in Mysore.*

*To*

D. M. Narasinga Rao, Esq., B.A., B.L.,
*Secretary to the Government of H. H. the Maharaja of Mysore,*
General *Department.*

SIR,

I have the honour to acknowledge with thanks the receipt of a copy of the specification of an invention for "Improved process of an apparatus for converting petroleum of a high boiling point into petroleum of a lower boiling point" by the Standard Oil Company, Indiana, sent with your No.G.17044-6/G.M.444-14-20 dated the 23rd June 1916.

I have the honour to be,
Sir,
Your most obedient servant,

M. Shama Rao,
Inspector General.

SAK.

V/21/7

TELEGRAPHIC ADDRESS: *Statewoks.*

No. 7192

MYSORE P. W. DEPARTMENT.

CENTRAL OFFICE,

*Bangalore*.....19th.....July.....1916.

DIARY NO 453

*From* Rajasabhabhushana

KARPUR SHRINIVASRAO, Esq., B.Sc., L.C.E.,

*Chief Engineer of Mysore,*

*Bangalore.*

*To*

D.V.Narasinga Row, Esq., B.A., B.L.,

Secretary to Government, General Department,

Bangalore.

Sir,

I have the honour to acknowledge the receipt of a copy o specification of an invention for "Improved process of, and apparatus for, converting petroleum or a high boiling point into petroleum of a lower boiling point" filed by the Standard Oil Company, Indiana, forwarded with your letter No.G.17044-6/G.M. 444-14-20 dated the 23rd June 1916.

I have the honour to be,

Sir,

Your most obedient servant,

R V Sundaramma

Deputy Chief Engineer of Mysore.

H.R.R.

GPB—500 13:1

191

MYSORE P. W. DEPARTMENT.

*No.*

*From*

THE CHIEF ENGINEER OF MYSORE,

*Bangalore.*

*To*

*Dated Bangalore*

*Despatched*

*Enclosure No.*

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SUBJECT.